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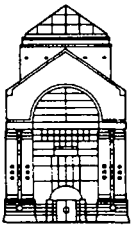

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Contents

Foreword

This volume presents the winning entries in the 17th Annual Chairman of the Joint Chiefs of Staff Strategy Essay Competition. As in years past, students at our professional military education institutions have produced creative, persuasive essays on subjects of strategic importance to the United States. It is no coincidence that every service is represented among the winners in the 1998 competition. Rather, it confirms the unique perspective and distinctive contribution which each of the services makes to the Nation.

Although readers may not agree with every author's arguments, each article helps refine our thinking about strategy by challenging some basic assumptions and asking important questions about the profession of arms. I congratulate the authors, their academic advisors, and their respective colleges for helping to stimulate thoughtful and relevant debate that will produce long-term benefits for the Armed Forces as we begin the 21st century.

HENRY H. SHELTON
Chairman
of the Joint Chiefs of Staff

Essays 1998

— *Does the 1997 Quadrennial Defense Review (QDR) Adequately Address Third Wave Logistics?*

S. M. FENSTERMACHER

The Wave Theory

Alvin and Heidi Toffler developed a thesis that the transformation of war can be studied in the same conceptual framework as the transformation of economics and sociology ("the way we make war reflects the way we make wealth.")[1] They tied their theory of war to their earlier social theory regarding the transition of civilization through major "waves" or "cycles" of societal structure. Their earlier theory argued that "the agricultural revolution of 10,000 years ago launched the first wave of transformatory change in human history; that the industrial revolution of 300 years ago triggered a second wave of change; and that we, today, are feeling the impact of a third wave of change."[2] Each wave brings a new kind of civilization and new measures of success.

Lieutenant Colonel S. M. Fenstermacher, USMC, shared first place in the 1998 Chairman of the Joint Chiefs of Staff Strategy Essay Competition with this entry, written while attending the Marine Corps War College.

Wave War

According to the Tofflers' wave theory, "agriculture became the womb of war" and generated the first great wave of societal change. They argue that although pre-agricultural society was violent, its conflicts did not possess the characteristics of true warfare (i.e., "clashes between organized states.") The food surplus generated from agriculture contributed to development of the state and provided both a reason and a means for warfare. The general character of resulting wars was shaped by the agricultural society's technology, organization, communication, administration, and reward structure. For example, the timing of First Wave wars coincided with seasonal farming requirements. Like farm tools, weapons were generally not standard. Combat was face to face, military organization was poor, communication was primitive, and orders were usually oral. Soldiers were paid with food or land. With few exceptions, First Wave warfare was a reflection of the First Wave economic engine: agriculture.

Second Wave War

The Tofflers then hypothesized that the industrial revolution launched the Second Wave of historical change. The characteristics of Second Wave society include mass production, mass consumption, mass education, and mass media, all linked together and served by specialized institutions and improved networks of transportation and communication. A key goal in a Second Wave society is to achieve economies of *scale*. Second Wave military structures mirror Second Wave society with huge military industrial complexes, mass armies, and standardization of equipment, training, organization, and doctrine. A key goal for Second Wave military development is the continual increase

in range, speed, and lethality of weapon systems. Indeed, Second Wave warfare is characterized by mass destruction.

Third Wave War

Third Wave social characteristics include knowledge as the central resource, de-massification (specialization) of production, markets and work units, increased skill requirements, constant innovation, systems integration, and acceleration of operations. A key goal of a Third Wave society (which is information based) is to achieve economies of *speed*. Third Wave military structure will become smaller with fewer organizational layers, more decentralized decisionmaking, and weapons based on information instead of volume of firepower.[3] Because modern technology has pushed the Second Wave elements of military development (range, speed, and lethality) to their outer limits,[4] the emerging integration of technologies is creating new ways to apply and measure military power and effectiveness. The Third Wave goal for military power is to achieve increasingly finer precision and greater selectivity[5]—maximizing military effectiveness by knowing precisely what, when, and where the "threat" is located and then reacting with the precisely appropriate response to achieve the exact desired results.

The Challenge

A key challenge for today's military leadership is to recognize and cope with the wave transition. U.S. military leaders must understand that the emergence of the Third Wave is causing a collision of wave fronts; this collision by itself will create conflict.[6] For example, social tensions can increase as industrial work forces finds themselves unemployed and ill prepared for new high-technology jobs. Misinterpretation of the cause of

tension or failure to provide adequate solutions can result in conflict. U.S. military leaders must also understand that the world will have different sectors functioning at all three levels of civilization simultaneously. The leadership must act quickly to prepare the U.S. military to compete in this "tri-sected" world. While the First Wave took thousands of years to play itself out and the Second Wave peaked in 300 years, Alvin Toffler suggests that "it is likely that the Third Wave will sweep across history and complete itself in a few decades."[7] In coping with the Third Wave transition, numerous aspects of operational doctrine, organization, training, equipment, and force structure will have to change in harmony with one another. Failure to synchronize improvements in these areas will cause operational inefficiency and will prevent full exploitation of potential capabilities. One of the areas requiring synchronization that will experience the greatest change will be logistics.

Logistics Implications of the Wave Theory

The Third Wave is redefining every aspect of society. The defense establishment must recognize the impact the new environment will have on logistics, in order to support emerging Third Wave capabilities fully; military success in the Information Age will depend on this. Third Wave logistics will be driven by improvements in information, communications, and transportation and will be characterized by integration, specialization, consolidation, reduction, mobility and agility. As with all aspects of the Information Age, the starting point for logistics implications is information.

The foundations of the Third Wave military environment are information and knowledge, which in this context are based primarily on the integration of multiple highly sophisticated or

emerging technologies. Integration of technologies and databases should improve data accuracy and asset visibility and may allow consolidation of manpower tasks. However, these technology integrations also complicate manning requirements. Logistics force structure specialists will discover or demand manpower efficiencies and will be tempted to consolidate tasks and subsequently cut structure. They must balance these opportunities against the dangers that will result from overdilution of the technical skills of individual Third Wave logisticians. Consequently, Third Wave logistics force structure specialists must accommodate three competing challenges: the specialization required by new systems and missions; the generalization allowed by simplification and consolidation of old tasks; and the depth and flexibility required to react to First, Second and Third Wave crises. In addition to looking inside the logistics community, Third Wave force structure specialists must also consider the ratio of logisticians to other warriors.

Just as Third Wave economies produce a shift in the labor ratio from "direct labor" to "indirect labor," Third Wave military organizations will see a shift in the "tooth" (support structure) to "tail" (combat power) ratio.[8] By increasing support teams (including logisticians and "information warriors"), the effectiveness of the gunfighters will be improved and thus the number of "trigger pullers" will be reduced. The concern should *not* be the ratio but rather should be the ultimate military effectiveness of the force. A smaller force can be better because it carries less friction and is likely to be more flexible.[9]

Improvements in information will affect Third Wave logistics in ways other than force structure. Better information allows more precise force packages to be developed to respond to threats; better information and more precise munitions may

allow fewer weapons to achieve desired results; fewer forces and weapons require less transportation and support; and reduced transportation and support infrastructure decreases the rear echelon force vulnerability by creating a smaller target, thereby freeing security forces for combat missions.[10] Furthermore, by having enough information about the threat to know what to leave behind, support stockpiling can be reduced.[11]

Information is key to the Third Wave, but several other Third Wave improvements will help reduce stockpiles and liberate the military from its Second Wave dependence on forward bases, pre-positioned supplies, and a gigantic logistics tail. Improvements in the speed and reliability of transportation and communication will allow supplies to be reduced and held outside of areas of operation; improvements in the visibility of inventory on hand, in transit, or available from the source will allow stocks to be ordered as required without the need for expensive safety levels; and exploitation of technology that allows objects to be built according to specifications transmitted from sites thousands of miles away will allow further reductions in pre-positioned stocks. All these factors will encourage decentralization of logistics control and will reduce the need for permanent foreign bases or supply depots.[12]

Third Wave changes will also affect infrastructure on the home front. Current contingency planning is based on assumptions that future conflicts will be short and "come as you are" operations. A review of military history reveals that we cannot always count on the expected "short war." Alan Gropman, who examined America's mobilization success in World War II, suggested that planning to mobilize the tools of war is essential:

> This analysis certainly does not call for resurrecting smoke stacks. If the next war is to be a "Third Wave" war, however, then attention must be paid to ensuring that "Third Wave" industries can be mobilized to support the combat effort.[13]

Third Wave logistics will require agile infrastructure capable of supporting rapid mobilization and rapidly changing demands. It will also require changes in the national industrial infrastructure, because national power will be derived from access to information instead of access to natural resources and plant investment, which are both Second Wave power sources.[14] Third Wave logistics will also drive the disappearance of most special-purpose military technology companies or cause them to fuse with nonmilitary commercial organizations.[15] During the transition, the challenge will be to bridge the gap between commercial capabilities and military requirements to perfect integration technologies and procedures.[16]

A vulnerability of the Third Wave environment is our reliance on information and numerous satellite and communications networks. Air Force visionaries acknowledge that "the domain of conflict is moving from earth into space and even into cyberspace."[17] Deputy U.S. Attorney General Jamie Gorelick told a Senate subcommittee in 1996 that the possibility of "an electronic Pearl Harbor" is a real danger for the United States.[18] Logistics information systems must be designed for survivability against this threat.

Third Wave logistics must also be able to support simultaneous multilevel operations throughout the spectrum of conflict. The need for this capability has two sources:

- It may be required because the United States could have multiple enemies with each functioning at a different level of

civilization and each requiring a different level of military response. The Tofflers provide an example of a Third Wave response to a Second Wave enemy:

> In the Gulf War two military modes, Second Wave and Third Wave, were employed. The Iraqi forces, especially after most of their radar and surveillance were excised, were a conventional "military machine." Machines are the brute technology of the Second Wave era, powerful but stupid. By contrast, the allied force was not a machine, but a system with far greater internal feedback, communication, and self-regulatory adjustment capability. It was, in fact, in part at least, a Third Wave "thinking system."[19]

In the Gulf War, the United States was fortunate to be able to focus its military energy on a single Second Wave force in a single theater. Future conflicts will likely be against multiple enemies in different theaters. Furthermore, because those enemies will improve their military capabilities at different speeds, the enemy forces in the different theaters will likely be operating at different levels. For example, an enemy in one theater could be a Third Wave force while the enemy in a different theater could be a Second (or First) Wave force. The United States must be capable of coping operationally and logistically with all enemies at all levels at the same time.

- The ability to support simultaneous multilevel operations may be required because of asymmetric advancement of emerging technologies. If multiple interrelated logistics or operational Third Wave technologies develop at different paces, parallel support will be required. For example, if technologies improve maneuver speed without improving fuel efficiency or without finding alternative power sources, the

resultant wider maneuver capability will require more bulk fuel and a massive global logistics support infrastructure.[20] In another example, if digital communications capabilities are fielded to augment rather than replace radio systems, technical and logistics support to field units will increase.[21] Consequently, logistics must be capable of sustaining both emerging and legacy weapon and support systems. These are complex conditions that will require highly trained people and flexible organizations as well as adaptive policies and procedures.

As outlined above, being swept up in the Third Wave has a number of logistics implications. It complicates force structure considerations, affects traditional tooth-to-tail calculations, allows stock reductions and decentralization of logistics control, and reduces the need for pre-positioned supplies and equipment. At the same time, it requires new emphasis on mobilization planning for a new set of industries, a shift in the national industrial infrastructure, and a fusion of military and commercial technology enterprises. Furthermore, Information Age logistics is complicated by several major challenges. First, Third Wave military reliance on information is both a strength and a weakness. Additionally, a Third Wave global military power must be able to operate in First, Second, *and* Third Wave environments simultaneously because of the multiplicity of its enemies and the asymmetry of its own technologies and systems.

Having outlined the logistics implications we can expect as we move farther into the Information Age, we must next determine if the *1997 Quadrennial Defense Review* (QDR) adequately addressed those implications in its plans for future defense programs.

How the QDR Sees the Future of Logistics

Although there is some overlap between the concepts, the QDR addresses logistics in five broad conceptual categories: focused logistics, strategic mobility, the revolution in business affairs (RBA), tooth-to-tail ratio, and the Army National Guard Division Redesign Program. Additionally, the QDR indirectly addresses elements of two Third Wave logistics concepts: simultaneous multilevel operations and mobilization of Third Wave industry.

Focused Logistics

One of the key elements of logistics in the QDR is the concept of "focused logistics," which originated as one of four new operational concepts described in *Joint Vision 2010*, the plan established by the Chairman of the Joint Chiefs of Staff (CJCS) for future military operations. *Joint Vision 2010* is designed to exploit technologies emerging in the information revolution which is creating a revolution in military affairs (RMA). Focused logistics is defined as:

> the fusion of information, logistics, and transportation technologies to provide rapid crisis response, to track and shift assets even while en route, and to deliver tailored logistics packages and sustainment directly at the strategic, operational, and tactical level of operations.[22]

The QDR does little more than restate the concept of focused logistics as described in the joint vision, stating that it "will reduce the overall size of logistics support while helping to provide more agile, leaner combat forces that can be rapidly deployed and sustained around the globe." The QDR also lists a few examples of joint and service information systems under

development that "should continue to result in more responsive logistics at lower cost."[23] The reason the QDR frequently defers to the details of the focused logistics initiative is that, like many of the concepts discussed in the QDR, focused logistics is a well-defined program with ties into many sources including the Joint Warfighting Capabilities Assessment (JWCA), the Joint Monthly Readiness Review (JMRR), the National Military Strategy (NMS), the Joint Strategy Review (JSR), service vision statements, and strategic logistics plans of the Commanders in Chief, the services, and the Office of the Secretary of Defense (OSD).[24] These ties ensure a broad base of knowledge and support and ensure integration of the concepts with the existing processes of strategy, planning, programming, budgeting, acquisition and review.

Strategic Mobility

The second element of logistics that received emphasis in the QDR is the area of strategic mobility. Although strategic mobility is a subelement of focused logistics, it was addressed separately in the QDR. The Defense Strategy section of the QDR lists a robust and effective strategic lift capability as a critical enabler for worldwide application of U.S. military power. Preconditions to such a capability include appropriate ships and aircraft, sufficient domestic and en route support infrastructure, strategically pre-positioned supplies and equipment, total asset visibility, and access to air and sea lines of communication.[25] An example of the criticality of this capability is evident, although not specifically addressed, in the QDR discussion of the need for "swing" capabilities in the event of two nearly simultaneous major theater wars (MTWs). Under those circumstances, certain low-density, specialized, high-leverage units or unique assets

would have to "swing" or redeploy between theaters.[26] The success of that redeployment would depend on the effectiveness of our strategic lift capability. In support of such a capability, the QDR reaffirmed DOD's baseline requirements for intertheater mobility, as outlined in the 1995 Mobility Requirements Study Bottom-Up Review Update, which included requirements for 50 million airlift ton-miles per day, 10 million square feet of surge sealift, as well as afloat and land-based pre-positioning programs.

Revolution in Business Affairs

A third key element of logistics in the QDR is the concept of the revolution in business affairs (RBA), which is focused on reengineering DOD infrastructure and business practices.[27] The Chairman of the Joint Chiefs of Staff stated that RBA is a precondition for realizing the full benefits of RMA.[28] Expected RBA results are numerous: shortened cycle times, enhanced program stability, increased efficiencies, assured management focus on core competencies, and increased availability of resources for high-priority programs.

Tooth-to-Tail Ratio

The fourth and most disappointing recurring logistics theme in the QDR is that of tooth-to-tail ratio. The Secretary's message suggests that the QDR has chosen a path that reallocates resources and priorities that will trim current forces primarily in the "tail" and modestly in the "tooth."[29] The Defense Strategy section notes the need to shrink DOD support infrastructure while the Forces and Manpower section states that the QDR's

> aim in taking manpower reductions is to preserve the critical combat capabilities of our military forces—"the tooth"—while reducing infrastructure and support activities—"the tail"—whenever prudent and possible." Finally, The Chairman's comments include the statement that "the most prudent solution to fulfilling all three parts of the [national security] strategy is to "preserve the teeth by cutting the tail."[30]

Army National Guard Division Redesign Program

The final area of logistics that received specific attention (albeit minor attention) in the QDR is the Army National Guard Division Redesign Program. Analysis of Army support requirements for two MTWs revealed a deficiency in combat support/combat service support (CS/CSS) capabilities. To fill the gap, the Army plans to convert 12 National Guard brigades from combat units to CS/CSS units. The QDR not only validated this plan but also accelerated its execution timeline.[31]

Capability to Support Simultaneous, Multilevel Operations

This idea was not addressed specifically as a logistics issue; nevertheless, elements of this concept are present within the overall balanced approach of the QDR. The QDR examined three alternative paths for achieving the goals of the defense strategy. One path focused more heavily on near-term security issues, one more heavily on long-term security issues, and a third on a combination of near- and long-term security issues. Realizing that U.S. interests and responsibilities would not allow a choice between near- and long-term issues, the balanced approach was selected. Within that framework, it was determined that U.S. forces must be capable of fighting and winning two MTWs nearly simultaneously and must be prepared

to conduct multiple concurrent small-scale contingency (SSC) operations worldwide. The QDR also discussed the ever-present requirement for information superiority and the possibility of both offensive and defensive information warfare as an element of all operations.

Mobilization of Third Wave Industry

The QDR does not specifically address planning for mobilization. However, this issue is discussed indirectly within the Agile Infrastructure section of the *Focused Logistics Roadmap*. The Secondary Item War Reserves subsection states,

> The ability of the industrial base to accomplish increased wartime production is an important factor in determining war reserves inventory levels. . . . War reserve requirements may be offset by industrial base planning, such as financial investment by DOD to guarantee industrial base response and/or access. The key to war reserve management is accurate identification of total requirements and investment in critical materials where access may be constrained or lead-time is unsatisfactory to meet operational requirements. The ultimate goal in this effort is a reliable requirements determination process within each Service, ensuring that Service-unique criteria (e.g., attrition factors, feeding plans, environmental conditions, etc.) are accommodated.[32]

Clearly, the above categories do not cover the gamut of Third Wave logistics requirements as outlined in this section.

Conclusions and Recommendations

The information age is upon us, and we are still adjusting to it. Our success in global competition will be determined by how

quickly and effectively we complete the Third Wave transformation,[33] the blueprint for which is outlined in the QDR. Fortunately, many areas of the QDR logistics discussions are consistent with Third Wave requirements of accelerated and knowledge-based operations, reduced mass, constant innovation, and systems integration. However, the QDR inadequately addresses other Third Wave logistics requirements.

Focused Logistics

The QDR's concept of focused logistics is consistent with the requirements of Third Wave logistics in many ways. Focused logistics is based on information fusion and exploitation of technology to provide improved data accuracy, asset visibility and systems interoperability. Focused logistics is also based on reducing cycle times and improving responsiveness while reducing inventories and infrastructure. Nevertheless, focused logistics is not consistent with the concepts of Third Wave logistics in all areas. For example, the *Focused Logistics Roadmap* states that:

> pre-positioned equipment remains a cornerstone of our force projection capability and allows us to offset our reduced forward-deployed presence and reduces our strategic lift requirements. Additional force structure reductions will not reduce, and could actually increase, the requirement for pre-positioning of material.[34]

The QDR and the *Focused Logistics Roadmap* are overreliant on land-based pre-positioning of supplies and equipment; the Toffler wave theory suggests that pre-positioning should be minimized to improve flexibility. While this may not be feasible in the short term, it should be part of long-term defense strategy

and program initiatives. Increased strategic lift capability is one potential solution.

Strategic Mobility

While Third Wave logistics requirements are based on expected quantum improvements in speed and reliability of transportation, the QDR's handling of strategic mobility is based on optimization and incremental improvement of current technology, doctrine, and procedures. In addition to procurement plans, this includes initiatives such as the Navy plan to transfer some combat logistics ships to the Military Sealift Command, which will allow reductions in crew size and increases in underway time.[35] Joint and service initiatives are focused on reducing infrastructure and logistics footprint but pre-positioning and overseas basing agreements are still large parts of the joint deployment and rapid distribution equations. To its credit, the QDR recognized that the mobility update had not accounted for several emerging Third Wave challenges, including increased potential for peacetime engagement, reduced support infrastructure at overseas bases, the likelihood of small-scale worldwide contingencies, and the increased possibility of confronting nuclear, biological, and chemical threats.[36] The National Defense Panel also emphasized the challenges associated with expected infrastructure reduction:

> U.S. forces may find themselves called upon to project power in areas where no substantial basing structure exists. The QDR, in our view, accorded insufficient attention to our ability to project power under these circumstances.[37]

The recent Gulf crisis provides an excellent example of the potential problems related to overreliance on pre-positioned

materiel and fixed advanced bases. Saudi Arabian leaders were reluctant to allow U.S. airstrikes from their soil against Iraq; consequently, extra Navy aircraft carriers had to be brought into the Persian Gulf. It is easy to envision other diplomatic complications with fixed sites; thus, mobile assets appear more useful in carrying out our national policy.

> "The political problem of getting access to bases overseas is going to become even more difficult," said Andrew Krepinevich, director of the Center for Strategic and Budgetary Assessments in Washington, DC. "It is going to be a more difficult problem and, geographically, there is no guarantee that we will fight where we have bases."[38]

One potential solution to this Third Wave power projection challenge is to build mobile offshore bases.[39] A potential military solution to the combined challenge of strategic sealift and power projection is the Marine Corps "Maritime Pre-positioning Force 2010 And Beyond" concept.[40] Focusing on the sealift problem, the National Defense Panel recommended greater exploration of emerging commercial concepts.[41] Potential procedural, financial, and legislative solutions to the sealift challenge include delinking shipbuilding from ship ownership; inducements to attract investment in U.S. shipping; elimination of restrictions on foreign investment, ownership, and operation of U.S. shipping; modification of programs that provide access to civilian sealift assets; incorporation of commercial specifications in military equipment to ensure equipment is transportable on a wide range of civilian lift assets; and support and nurturing of the pool of merchant mariners.[42]

In addition to the simple solution of increasing the number of sealift ships, defense leaders must support the exploration of

all the concepts discussed above to ensure survival of the most viable programs and to ensure the creation of a flexible and dynamic sealift capability to accommodate the rapidly approaching Third Wave logistics challenges.

Revolution in Business Affairs

The QDR leads one to believe that the primary role of the RBA is to serve as a source of funding for both short-term operations and long-term investment. Nevertheless, RBA as defined in the QDR is consistent with the requirements of Third Wave logistics. Some RBA initiatives are causing the expected Third Wave blurring of civilian and military technologies and support mechanisms. Furthermore, while RBA discussions address only the consolidation and elimination of traditional infrastructure, other sections of the QDR make it apparent that the overarching trend is a shift from traditional to information related infrastructure—command, control, communications, computers, intelligence, surveillance, and reconnaissance (C^4ISR) architecture. Even many of the traditional consolidation projects will result in informational improvements such as increased data control, accuracy, and visibility.

Tooth-to-Tail Ratio

The QDR's repetition of the simplistic statement "preserve the teeth by cutting the tail" focuses attention on the wrong goal. As the Tofflers argue, the concern should *not* be on lowering or raising the tooth-to-tail ratio. Rather, the concern should be on achieving whatever balance of tooth-to-tail is required to produce the greatest military effectiveness.

There are some dangers with the QDR approach. First, viable reallocation and reengineering alternatives might be missed

or discarded if they do not fit the mold of "preserve tooth while cutting tail." Second, future planners might erroneously "learn" that the rule for force reallocation is *always* to "preserve the teeth while cutting the tail." Although there will be times that cutting the tail may be appropriate, we should remember that the ratio itself is irrelevant. The relevant factor is the ultimate military effectiveness of the force. This point is reinforced in the National Defense Panel's May 1997 assessment of the QDR, where the Panel noted that exploiting advanced technology and operational concepts (which can include advances in logistics technology and concepts) "may permit us to be successful with smaller but far more lethal and effective forces."[43]

The U.S. National Security leadership must transform the defense establishment into a Third Wave force with the understanding that a tooth-to-tail ratio is irrelevant. The "right" ratio is the one that achieves maximum operational effectiveness of the force. Defense leadership guidance in this area should shift its focus from the concept of "reducing the tail" to the goal of "improving effectiveness" with effectiveness being defined by the defense capability to be achieved.

Army National Guard Division Redesign Program

This program was discussed in the context of Army force structure realignments made possible by changes in the global strategic environment. During the Cold War and in the period immediately following the Cold War when relations with countries of the former Soviet Union were uncertain, the National Guard served as a "strategic reserve." Today, the need for that capability has declined, making some National Guard force structures available for realignment from unneeded combat units to needed CS/CSS units. This is an example of a shift in

the tooth-to-tail ratio where tooth is turned into tail. This is consistent with the concepts of Third Wave logistics and runs counter to the oversimplified statements in the QDR regarding "preserving teeth while cutting tail," thereby strengthening the earlier argument.

Vulnerability of Logistics Data

Although not specifically addressed in the focused logistics discussions in the QDR, protection of logistics data and logistics information networks is covered in two other areas. First, because logistics systems are carried on standard defense communications networks, some protection is provided under the umbrella of information assurance initiatives outlined in other parts of the QDR. Furthermore, the *Focused Logistics Roadmap* briefly discusses data security alternatives being developed to prevent unauthorized access.[44]

Because information is not only the key to success but also a critical vulnerability in the Third Wave, protection of logistics data cannot be overstated. Consequently, both general defense and specific logistics guidance regarding future programs should include expanded discussions on vulnerability of logistics data and plans for potential solutions.

Capability to Support Simultaneous, Multilevel Operations

Neither the QDR nor the *Focused Logistics Roadmap* specifically addresses a need for this capability. However, the *Focused Logistics Roadmap* acknowledges the challenges of uncertain conditions, stating "Logisticians must now demonstrate the capability to tailor forces and resources by both expanding and contracting as the nature of our threats change from large scale

MTW to SSCs. Effective execution of these missions requires an adaptive, responsive and reliable logistics system to make it happen."[45] While this does not discuss the issue in terms of the Tofflers' levels of war, if logistics support can achieve the stated goals, it will be sufficiently resilient to handle First, Second, and Third Wave logistics requirements. Nevertheless, follow-on versions of general defense guidance and specific logistics guidance regarding future programs must be expanded to clearly address the Third Wave requirement for simultaneous multi-level operations. Lesser powers can afford to operate in one dimension; ss a global power, the United States must be able to operate successfully in all.

Mobilization of Third Wave Industry

Future conflicts will require an industrial mobilization capability that can support operations of all sizes and durations. While the concept of industrial mobilization falls under the umbrella of Focused Logistics, it is clear that the direction of potential industrial mobilization is being left to the services using existing procedures. Neither the QDR nor the *Focused Logistics Roadmap* discusses a need for modification of the approach to accommodate the changing environment.

The National Defense Panel criticized the existing mobilization approach as inappropriate and suggested the criteria of balance, timeliness, relevance, and synchronization as characteristics for a new approach.[46] Nevertheless, the competing nature of balance and relevance complicates the search for a solution. First, the new approach must balance current and future warfighting capabilities. Second, although short-war scenarios place a premium on adequate stocks of on-hand weapons, stored weapons, materials, parts, and manpower are

not necessarily relevant to the mobilization needs of future warfare in these times of rapid technological advancement.[47] One solution to this dilemma is the concept of *agile manufacturing*:

> Agile manufacturing is a generic term for a number of competition-enhancing initiatives that include lean and flexible factories, networked information systems, and cross-boundary communications throughout and among various value chains.[48]

The goal of agile manufacturing is to react quickly to changing customization requirements by maintaining production processes that are rapidly configurable:

> Agile manufacturing seeks to reduce response time and increase manufacturing flexibility so that every customer order can be satisfied. Ultimately it would mean that the industrial base would never have to be mobilized.[49]

Future defense guidance must address mobilization of Third Wave industries. Furthermore, while the concept of agile manufacturing may not be relevant in the short term, the defense establishment must understand and embrace this concept to ensure it reaches its full potential as a support mechanism for industrial mobilization. This is especially true since the QDR paid so much attention to reduction of infrastructure.

Summary

Many areas of QDR logistics discussions are consistent with Third Wave requirements. Focused logistics is based on information fusion, exploitation of technology, reduced cycle times, and improving responsiveness while reducing inventories

and infrastructure. RBA initiatives are designed to reduce overhead, streamline infrastructure, leverage commercial technology, reduce standards, and integrate process and product development. The Army National Guard Division Redesign Program is an example of force structure realignment from tooth to tail to achieve better balance.

Other areas of QDR logistics discussions fall short of Third Wave requirements. Instead of trying to become free of fixed bases, existing strategic mobility plans rely heavily on pre-positioning to reduce lift requirements. While this solves problems in some geographic areas, it reduces flexibility and ties U.S. forces to pre-positioning sites. Future focus must be on power projection without reliance on forward basing of people or equipment. Also, the QDR is littered with statements about "preserving teeth while cutting the tail." While this is a great sound bite, it is overly simplistic and can be misinterpreted. Last, the QDR inadequately addresses the vulnerability of logistics data, simultaneous multilevel support, and industrial mobilization requirements.

Because of shortcomings in the QDR logistics discussions, as the U.S. military transforms into a Third Wave force, U.S. defense leadership should provide supplemental guidance to:

- Emphasize power projection in areas without forward support bases
- Direct the examination of long-term initiatives to reduce equipment pre-positioning and to exploit improvements in speed and reliability of strategic mobility
- Direct the examination of the full range of military, commercial, legal, financial, and procedural options to improve strategic sealift capabilities

- Acknowledge the shift in importance from traditional to information-based infrastructure
- Explain that a tooth-to-tail ratio is irrelevant and that the "right" ratio is the one that achieves maximum operational effectiveness of the force
- Emphasize the vulnerability of logistics data and the need to be able to conduct simultaneous multilevel operations, for an improved industrial mobilization approach, and to develop and exploit agile manufacturing capabilities.

By implementing these logistics recommendations, future U.S. forces will be more capable of meeting the criteria for Third Wave military success.

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25. *Report of the Quadrennial Defense Review*, 17.

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27. *Report of the Quadrennial Defense Review* defines RBA as reducing overhead and streamlining infrastructure; taking maximum advantage of acquisition reform; outsourcing and privatizing a wide range of support activities when the necessary competitive conditions exist; leveraging commercial technology, dual-use technology, and open systems; reducing unneeded standards and specifications; utilizing integrated process and product development; and increasing cooperative development programs with allies.

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29. *Report of the Quadrennial Defense Review*, v.

30. Ibid., 17 and 31.

31. *Report of the Quadrennial Defense Review*, 33 and 47.

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We Deceive Ourselves: The Role of Preconception in Operational Deception

JAY LEE HATTON

We are never deceived, we deceive ourselves.
Michael Handel[1]

Critical Role of Preconception

The military profession demands the constant attention of its practitioners. Professional soldiers, like doctors or lawyers, must read, study, and articulate both the historical foundations and the recent innovations of their craft. Despite a renewed emphasis on the functions and elements of the operational art, including operational intelligence, the value of *operational deception* is often overlooked outside the hallowed halls of academia. Professor Michael Handel, a noted academic authority on military deception,[2] explains:

Major Jay Lee Hatton, USMC, shared first place in the 1998 Chairman of the Joint Chiefs of Staff Strategy Essay Competition with this entry, written while enrolled in the College of Continuing Education at the Naval War College.

> The typical military commander shows little interest in deception, and is often wary of its use. The only way to change this attitude is to teach about the successful use of deception by using detailed historical case studies as the starting point.[3]

Make no mistake, the fascination of operational commanders with the collection of intelligence information is as strong as ever and is well represented in our doctrine by such concepts as the Intelligence Preparation of the Battlefield (IPB). However, the very nature of IPB, with its emphasis on a thorough, calculated collection of the "facts," makes it susceptible to enemy deception. What we don't see, for example, is often more important than what we see clearly. It is our *framework for interpreting* what we see or do not see that is central to our ability to predict enemy intentions. This interpretive framework is more important than hundreds of "critical elements of information" or dozens of map overlays. Professor Milan Vego, professor of operations at the United States Naval War College, notes:

> History abundantly shows that intelligence is not nearly as critical as the attitude with which it is received by an operational commander and his staff. Operational intelligence must be believed to be effective. *It must compete with the preconceived ideas and beliefs of its users*; these in turn not uncommonly lead the commander and his staff to misapply previous experience or ignore valuable intelligence [emphasis added].[4]

History's best examples of successful operational deception illustrate the importance of the deceiver tailoring his efforts to match the preconceived notions, ideas, or beliefs of the deceived. However, despite this historical evidence, the critical role of preconception (for both ally and enemy) receives little attention

in U.S. joint and service planning and exercises. This oversight does not appear to be the result of flawed doctrine; in fact, as we shall see, U.S. doctrine clearly emphasizes the vital role of preconception in deception operations. Instead, today's operational commanders simply do not have the additional time or force structure necessary to plan for and conduct extensive deception operations. Whatever the reasons, this omission raises serious questions about the capacity of our future commanders to understand and exploit enemy preconceptions, as well as the ability of our intelligence community to facilitate this exploitation and to guard against falling victim to the same phenomena.

This paper will demonstrate the importance in deception operations of leveraging the enemy's preconceptions regarding friendly capabilities and intent, and the impact of preconception on the operational art. This will be accomplished by examining the conceptual foundations of preconception, illustrating its effects using historical examples, and examining its relevance within the framework of current U.S. military doctrine.

Conceptual Foundations

The seminal facts contained in the conceptual foundations of preconception are addressed within the framework of two questions: "*Why* has preconception proven to be decisive in military deception?" (cause) and "*When* has it proven to be decisive?" (effect).

The Bias Factor

Although a detailed analysis of the role of preconception in military deception would be complex, the answer to our framing question of "why" is really quite simple: preconception is a factor in deception operations because human beings are the primary

agents for analyzing intelligence. This is true even in today's environment of high-tech gadgets and wizardry. Devices gather *data*; but humans shape that data into *intelligence*. Action, therefore, is based upon the way in which an individual or organization interprets the data they receive. According to T. L. Cubbage, former military intelligence officer turned author and historian, herein lie the "roots of failure."[5]

In his work, "German Misapprehensions Regarding Overlord: Understanding Failure in the Estimative Process," Cubbage identifies ten "perception blocks" that he believes led to the failure of the German intelligence apparatus during the Second World War. Calling the most significant of these perception blocks the *Bias Factor*, he elaborates:

> The central themes here are the patterns of erroneous perception and judgment, i.e., "biases" or errors in judgment that are consistent and statistically predictable in the sense that in a large number of cases, most people will be influenced by such tendencies most of the time.[6]

Cubbage further identifies the humanistic causes of the Bias Factor. These causes include cultural biases, projection, cognitive biases, and something he refers to as the Current Expectations Factor.

Cultural Bias. Cubbage, relating the important influence a person's cultural heritage has on his preconceptions, states, "Cultural biases . . . are rooted in the basic predisposition inherent in the analyst's cultural values and heritage."[7]

Projection. The concept of projection is a familiar one; the idea that "everyone must be like me" is central to the human psyche and affects our day-to-day interactions with others. In the world of international affairs, projection can be a dangerous

undertaking as nations with extremely diverse cultural foundations meet on the slippery slope of conflicting national interests and will. In this environment, projection is particularly visible in those countries with strong cultural biases—"we have chosen a democratic government and are happy; therefore, they should choose a democratic government and be happy."

In deception operations at any level, projection describes the tendency of military commanders and intelligence analysts to anticipate enemy courses of action based on what they would do if faced with a similar set of circumstances and focus on that anticipated outcome at the expense of other equally viable alternatives. These preconceptions founded on projection are often stubbornly maintained in the face of contradictory intelligence data. Cubbage explains:

> The concept of projection relates to the tendency of human perceptions to be ethnocentric. That means seeing the external world inside out, which typically involves the projection of one's own belief systems, and, by definition, causes the underestimation, if not the denigration, of one's opponent's culture, motivations, intentions, material and technological achievements, and the capacity to identify with others.[8]

Two excellent examples of cultural bias and projection manifested themselves during December 1941. First, the general disdain felt by American leadership for both the engineering acumen and operational prowess of the Japanese contributed greatly to the nasty surprises of the "Zero" aircraft and Pearl Harbor. At about the same time, a similar cultural superiority complex caused the German leadership to seriously underestimate the ability of the Red Army to recover from the terrific defeats of the previous summer and rally to defend Moscow. This error in

estimation greatly multiplied the shock and surprise of Zhukov's counterattack that ultimately saved the Soviet capital.

Cognitive Bias. Cognitive activities are those of reasoning or thinking. As Cubbage explains, "The cognitive biases result simply from the way the mind tends to work and not from any intellectual or emotional predisposition toward a certain judgment."[9] Simply stated, the conclusions we deduce in a given situation are as much a product of our thought or logic processes as they are of the data with which we begin. An example of this concept is the notion of causation:

> An analyst can see a plane or a tank, but he cannot see causation. Instead, the analyst's individual perception of causation results only from a complex process of inference, and as with other forms of inference, his specific perceptions are subject to systematic biases.[10]

Current Expectations Factor. One of Cubbage's most important conclusions is the idea that the data that a military commander or intelligence analyst receives will be unconsciously screened as a matter of course. He calls this the Current Expectations Factor. At work in the Current Expectations Factor is the propensity for any data that fit with a person's preconceptions to be highlighted while data that do not fit are ignored or undervalued:

> Many experiments demonstrate the extraordinary extent to which the information obtained by an analyst depends on his preconceptions, expectations, and even his assumptions. An analyst's expectations have many diverse sources, including past experience, professional training and cultural and organizational norms; all of which predispose the analyst to pay particular

> attention to certain kinds of information and to organize and interpret this information in certain ways.[11]

These contributions to the Bias Factor illustrate the importance Cubbage places on the humanistic factors as they affect deception operations.

Theory of Cognitive Dissonance

One psychological theory that helps tie these concepts together is the *Theory of Cognitive Dissonance.* Originally developed by Kurt Lewin in the 1930s and advanced by Leon Festinger in the 1950s, the Theory of Cognitive Dissonance maintains that human beings feel tension and discomfort when holding ideas that are inconsistent with their "schema" and will always seek ways to decrease that dissonance.[12] Festinger illustrates the theory:

> Suppose an individual believes something with his whole heart; suppose further that he has taken irrevocable actions because of it; finally, suppose that he is presented with evidence, unequivocal and undeniable evidence, that his belief is wrong: what will happen? The individual will frequently emerge, not only unshaken, but even more convinced of the truth of his beliefs than ever before.[13]

The military implications of this theory are far reaching. When viewed in its truest form, this idea takes Cubbage's notion of "current expectations" one important step further. Recall that Cubbage believes that the perceptions of an intelligence analyst are based on certain predetermined factors such as culture, ideological beliefs, organizational norms, and military doctrine. He concludes that "the current expectations factor is a

fundamental principle of perception: analysts tend to perceive what they expect to perceive."[14] Festinger's theory further hypothesizes that once an individual makes up his mind, as influenced by the humanistic factors outlined above, he will be most reluctant to change it even in the face of compelling evidence to the contrary. For example, Joseph Stalin steadfastly refused to change his mind regarding German intentions in the summer of 1941, despite overwhelming evidence that the *Wehrmacht* was staging for an attack. In his work *Strategic Deception: A Psychological Perspective*, Richards J. Heuer, Jr., discusses this phenomenon:

> As a general rule, we are more often on the side of being too wedded to our established views and thus too quick to reject information that does not fit these views, than on the side of being too quick to reverse our beliefs. Thus, most of us would do well to be more open to evidence and ideas that are at variance with our preconceptions.[15]

Heuer also touches on this notion of intelligence work and deception as a study in *dilemma*. He states:

> If people can explain new evidence to their own satisfaction with little change in their existing beliefs, they will rarely feel the need for drastic revision of these beliefs. Deception provides a readily "available" explanation for discrepant evidence: if the evidence does not fit one's preconceptions, it may be dismissed as deception.[16]

Thus, Heuer provides our targeted intelligence analyst or military commander with a ready-made way of decreasing their dissonance; if the evidence does not support what they originally concluded based on their preconceptions, it must be part of the

enemy's deception effort. Heuer cites Adolf Hitler as an example of this phenomenon, noting that *Der Fuhrer* often ignored accurate intelligence information if that information contradicted his views on the subject, attributing the variance to enemy deception efforts.[17]

In summary, preconception is decisive in military deception because it serves to shape the participants' analyses of intelligence data, leading them to act on prepossessed notions with respect to the enemy's intentions or order of battle. The Theory of Cognitive Dissonance holds that, once these notions are implanted, they are not likely to be changed, regardless of evidence to the contrary.

Examples of Operational Deception

When has preconception proven decisive? Examples are legion, but three of the most illuminating cases include the British campaign in Palestine (1917-18), the Battle of Leyte Gulf (1944), and the Normandy Invasion (1944).

Palestine (1917-18). One of the first modern commanders to deliberately integrate large-scale deception plans with operational maneuver concepts was General Sir Edmund Henry Allenby, commander of the Allied Egyptian Expeditionary Force (EEF) during World War I. Fresh from the bloody stalemate in France, Allenby launched a deliberately conceived deception campaign aimed at enhancing the striking power of his forces by confusing the enemy's leadership regarding timing, location, direction, and method of his offensives. His deception techniques included dummy radio traffic, false troop concentrations, and the "lost order" ruse. During the Palestinian campaign of 1917, Allenby's deception efforts were aimed at reinforcing the Turkish belief that the EEF would attack from the

direction of Gaza and that the attack would be supported by an amphibious landing north of that city.[18] Using many of these same deception techniques during his follow-on 1918 campaign, Allenby again proved that "The EEF was aware of the Turkish-German way of thinking" by basing his deception plans on established enemy preconceptions.[19] Dr. Yigal Sheffy, professor in the Program for Security Studies, Tel Aviv University, elaborates on the deception effort of 1918:

> Allenby himself pointed to the realization of this basic assumption: "The enemy was thought to be anticipating an attack in these directions (Madeba or Amman) and every possible step was taken to strengthen his suspicions."[20]

Allenby was brilliantly successful in both campaigns, and his success was due, in no small part, to his understanding of the importance of deception as a force multiplier and his comprehension that successful deception merely serves to reinforce the enemy's predisposed beliefs.

Leyte Gulf (1944). An excellent example of the danger of "projection" on the part of an operational commander and his staff is found in the decisive naval battle at Leyte Gulf. Admiral William "Bull" Halsey and his staff projected two central themes of American naval doctrine onto their Japanese opponents during this battle. First, no American naval commander would dare venture outside the protective umbrella of friendly air cover to engage an enemy fleet of any consequence, particularly if that enemy possessed strong air forces himself. Vego points out the projection of this doctrinal rule onto the Japanese by Allied intelligence planners prior to Leyte Gulf:

> The intelligence summary for SOWESPAC on 15 October stated that "As to the [Japanese] Navy, while it may move in strength in and out of protected stations in home and adjacent waters, it is doubtful if it will seek any issue beyond the cover of land based airplanes."[21]

Second, after the disaster at Pearl Harbor, U.S. naval doctrine had irrevocably shifted away from a reliance on heavy "gun-deck" surface combatants in favor of the aircraft carrier. The aircraft carrier had become the decisive weapon of naval warfare; consequently, the American main effort in any clash of surface fleets would invariably fall to the carrier air groups. Halsey and his staff assumed the same could be said of their opponents, even after the debilitating losses in trained naval aviators the Japanese suffered after Midway. E. B. Potter notes:

> Hostile carriers were, in Halsey's opinion and in the opinion of practically all naval commanders at that time, the principal threat to any operation involving ships or shipping.[22]

The Japanese deception plan played directly upon these American preconceptions. Vice-Admiral Jizaburo Ozawa's carrier force, practically denuded of aircraft and pilots in previous battles, acted as the bait to lure the American carriers away from the Leyte invasion fleet. Once the invasion fleet was uncovered, the Japanese main effort, composed of two surface combatant task forces (but no carriers), was to fall upon the Americans and destroy them in a classic surface action. History records that Halsey all too readily took Ozawa's bait. The serious consequences of this mistake were mitigated only by the subsequent failure of the Japanese surface commanders to press

home their attack through the thin screen of American destroyers and "jeep" carriers and into the vulnerable transports beyond.

The Normandy Invasion (1944). Perhaps the best documented example of the role of preconception in military operations is provided by the Allied deception efforts prior to the invasion of France in 1944. The seeds for the Allied success actually were sown by the Germans themselves during 1943 and early 1944 when the Germans embarked upon a concentrated effort to anticipate where the Allied blow would fall. Painstakingly analyzing the pros and cons of every possible invasion site, the German analysts concluded that the best location for assault was the Pas-de-Calais region of France. Once made, this entirely logical conclusion immediately began to take on a life of its own. Cubbage explains:

> The Germans began to prepare their defenses accordingly. At that point the current expectations factor began to interfere with the German perception capability. Having concluded that the enemy would land in the Pas-de-Calais, the Germans naturally tended to ignore or misinterpret indicators pointing to large-scale landings in other sectors. Inasmuch as the current expectations seemed logically sound—and they were the product of careful study—they carried with them their own self-proving persuasiveness.[23]

Using ULTRA (the secret U.S. code-breaking system used in WWII) and other intelligence sources, the Allies were well aware of the German conclusions in this regard and subsequent Allied deception efforts under the overall codename *Fortitude South* were aimed at reinforcing this German preconception. Using massive numbers of rubber vehicles, aircraft, and emplacements, the Allies created a phantom army, the 1st U.S. Army Group (FUSAG),

and placed at its head their best general (in the German's view), Lieutenant General George S. Patton. When the actual landings occurred in Normandy, the Allies continued to transmit radio messages to and from FUSAG, thereby "convincing" the Germans of what they were already predisposed to believe—that the Normandy landings were only a feint designed to draw their strategic reserves away from the Pas-de-Calais where FUSAG would purportedly come roaring ashore any day. Vego notes that the Germans "relied in fact on indications and intentions, not the hard intelligence that would have told them Normandy was the only possible invasion site."[24] The resultant delay in the commitment of the German armored reserves was central to the subsequent Allied victory in Normandy and sealed the fate of the tottering Third Reich.

These operational deception efforts were ultimately successful because they reinforced what the enemy already believed to be true. But how well has the U.S. military assimilated these historical lessons and codified them in doctrine?

Review of U.S. Deception Doctrine

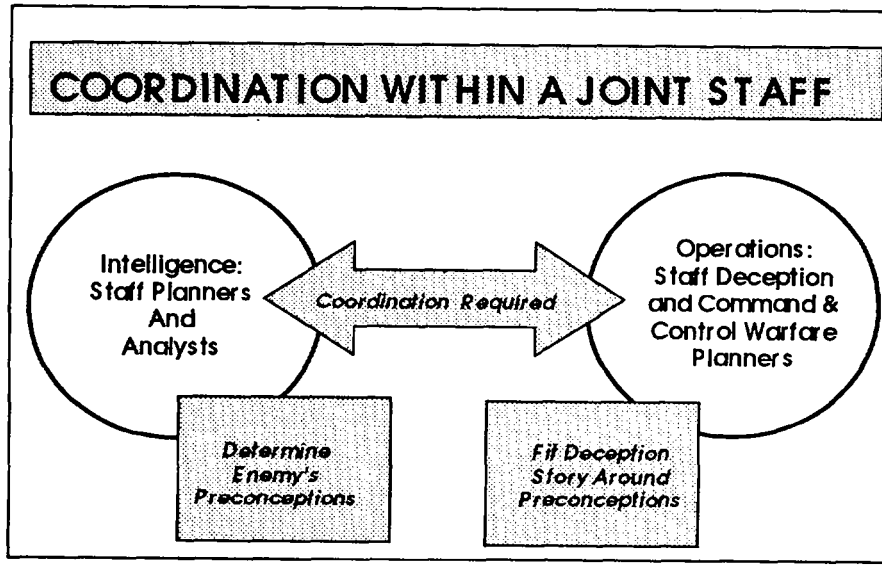
Doctrinal Review

Although a number of joint publications deal peripherally with deception operations, the capstone doctrinal vehicle on the subject is Joint Pub 3-58: *Joint Doctrine for Military Deception.*[25] This document provides a high-level overview of the planning for and application of joint military deception operations, to include a description of the interconnectivity between deception planning and the joint operational planning process.

The concept of preconception, more often called "perceptions" or "perception management"[26] in joint doctrine, is referred to a number of times in Joint Pub 3-58. The doctrine

clearly states that deception planning is primarily an operational task supported by the other aspects of command and control warfare, to include intelligence. The authors note that intelligence personnel are responsible for ascertaining "the adversary's perceptions of friendly capabilities and possible courses of action." Intelligence analysts "help the deception planners understand how the adversary decision makers, their staffs, and trusted advisors perceive friendly capabilities and intentions," illustrated in figure 1.

Figure 1. Coordination within a Joint Staff



Source: Adapted from figure III-1, Joint Pub 3-58, III-2.

The link between the enemy's preconceptions and the selection of a deception plan/story is also clearly drawn in the sections of the publication dealing with the planning process, specifically, the

Staff Deception Estimate (a subset of the Operations Estimate). The authors note:

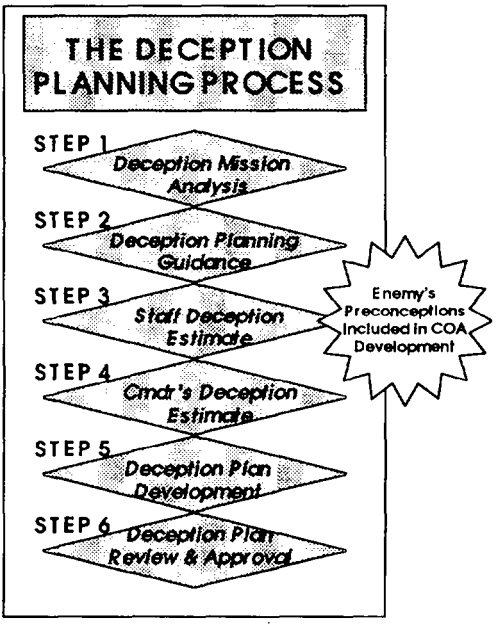
> Working with the operational planners, the other C^2W planners, and intelligence analysts, the deception planners gather and analyze information relating to the adversary. They identify the key decision makers and study all available information relating to their backgrounds and psychological profiles.
>
> They consider the adversary's C^2 system and decision making process. They study its intelligence collection and analysis capabilities. *They identify any preconceptions that the adversary leadership may have about friendly intentions and capabilities* [emphasis added].[27]

A direct correlation is drawn between the identification of an adversary's preconceived notions about U.S. force capabilities and intentions and the selection of a deception story or "desired perception" by the deception planners as part of the operations estimate (figure 2).

In its appendices, Joint Pub 3-58 eliminates all doubt about the doctrinal value of preconception in joint deception operations. The authors conclude: "It is much easier, and historically more effective, *to reinforce an existing belief* that to establish a new one . . . the [deception] story must correspond to the *deception target's perceptions* of the friendly force's mission, intentions, and capabilities."[28]

On the other hand, a review of component deception doctrine reveals a marked tendency by most of the services to limit their discussion of deception operations to the tactical level of warfare. Deception operations at this level are generally small-scale, short-term efforts designed to influence low-level decisionmakers in the

Figure 2. The Deception Planning Process



Source: Adapted from figure IV-1, Joint Pub 3-58, IV-3.

enemy's chain of command, and as such, the impact of preconception as an element of deception receives less emphasis. One notable exception to this limitation in component doctrine is evident in Field Manual 90-2: *Battlefield Deception*.[29] This document provides an excellent overview of the value of deception across the entire spectrum of conflict, emphasizing in particular the value of leveraging the enemy's preconceptions in these operations. In fact, the Army identifies "the exploitation of perceptions" as the number one "theoretical guideline" underpinning their deception doctrine.[30] This theoretical guideline, called "Magruder's Principle," makes the following argument:

> It is generally easier to induce an enemy to maintain a pre-existing belief than to present notional evidence to change that belief. Thus, it may be more useful to examine how an enemy's existing beliefs can be turned to advantage than to attempt to change his beliefs. . . . There is ample historical evidence to confirm the truth of Magruder's Principle.[31]

Drawing on a previously compiled database of 232 historical battles, the authors of Field Manual 90-2 illustrate the emphasis traditionally placed on devising deception stories to fit enemy preconceptions, as well as the improved probability of achieving surprise when preconceptions are incorporated in this fashion (figure 3).

Figure 3. Historical Value of Preconception

WAS DECEPTION EMPLOYED?	WERE PLANS KEYED TO ENEMY PRECONCEPTIONS?	WAS SURPRISE ACHIEVED?			TOTALS OR SUBTOTALS
		YES	NO	UNKN	
YES	YES NO UNKNOWN	106 17 8	4 4 1	0 0 0	110 21 9
NO	YES NO UNKNOWN	8 5 12	0 1 58	0 0 0	8 6 70
UNKNOWN	YES NO UNKNOWN	0 0 0	0 0 0	1 1 6	1 1 6
TOTALS OR SUBTOTALS		158	68	8	232

Source: Adapted from figure 1-1, Field Manual 90-2, 4.

These numbers lend credence to the supposition of this paper, that is, the valuable role preconception plays in successful deception operations. Note that when deception has been deliberately employed using the enemy's preconceptions, surprise was achieved 96 percent of the time. On those occasions that deception was employed and the enemy's preconceptions were not used, surprise was achieved only 81 percent of the time.

Critique

A number of preliminary conclusions can be drawn from this doctrinal review. First, the value of preconception in operational deception is heavily emphasized, particularly in joint and Army doctrine. However, this positive conclusion is potentially offset by other, less favorable, factors. For example, there is a noticeable paucity of information regarding the use of preconception at the strategic level, or of the utility of strategic deception in general (figure 4).

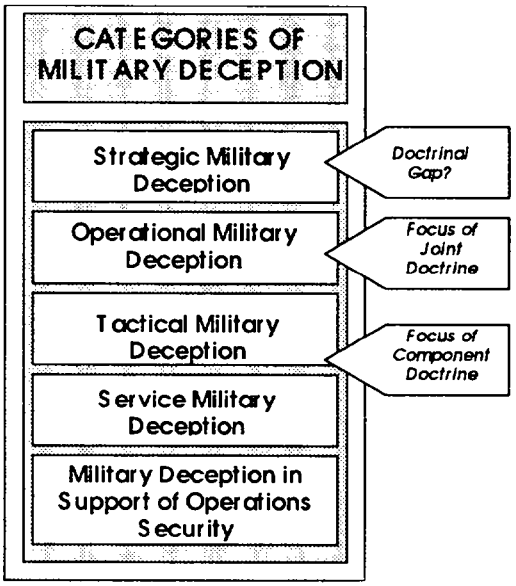
There is little or no discussion of the decisive value of effective deception at the strategic level of warfare, nor of the means employed (diplomatic or economic), other than military, to achieve strategic deception (although this doctrinal "gap" may simply be symptomatic of the limits of the research conducted for this paper, which focused exclusively on military doctrine).

More importantly, there appears to be sufficient cause for concern regarding how effectively our joint or component commanders and their staff planners are translating this deception doctrine into action. In 1988, the Army characterized deception planning and execution as a "lost art," warning:

> Today, commanders use little deception in planning, directing, and conducting combat operations. As a result, many deception-related skills that have served our Army well in the

past have been forgotten, and where remembered, have not been made part of our warfighting capabilities Armywide.[32]

Figure 4. Categories of Military Deception



Source: Adapted from figure I-1, Joint Pub 3-58, I-1.

They further identified three key factors that were contributing to the demise of deception-related skills in the United States military:

- Advances in technology are perceived to make successful deception more difficult, if not impossible, to achieve.
- Commanders are reluctant to devote scarce resources, including time, to tasks that are considered less essential.
- Force modernization, being primarily focused on high-cost force structure and materiel initiatives, has pushed

low-cost, perceived intangibles like deception further into the background.[33]

It is interesting to note that these three factors, rather than decreasing in intensity over the past 10 years, have steadily gained momentum in an era characterized by shrinking defense budgets, perceived reductions in threat force capabilities, and increasing commitments to less conventional operations.

Conclusion

It is important to realize that, although the examples provided herein illustrate the historical role of preconception in operational deception, it remains an effective influence even in today's environment of electronic surveillance and satellite reconnaissance. The human factor has not been, nor will it likely ever be, removed from the "art" of deception, in spite of the advances in the "science" of intelligence collection. During Operation *Desert Storm* (1991), the allies placed two full Marine Expeditionary Brigades (17,000 Marines) off the coast of Kuwait, thereby convincing the Iraqis that an amphibious invasion was imminent. In reality, the allied main effort was aimed at the more vulnerable Iraqi defenses in the open desert to the north of Kuwait. This operational deception effort was designed to take advantage of the enemy's sensitivity to their newly acquired territory and their perceptions of the U.S. Marines. The reputation of the Marines was well known to the enemy, as was their traditional role as the spearhead of American assaults. Accordingly, the Iraqis placed their best infantry divisions along the coast to defeat any attempts by the Marines to land. Miles of trenches and other fortifications were built to support this effort. A report published by the Defense

Department shortly after the conclusion of the war summarized the objectives of the allied deception effort:

> Throughout the planning process [during *Desert Shield* and *Desert Storm*], CINCENT emphasized the need for a comprehensive plan to deceive Iraqi forces regarding Coalition intentions and to conceal the Coalition scheme of maneuver. The deception plan was intended to convince Iraq that the Coalition main attack would be directly into Kuwait, supported by an amphibious assault. The plan also sought to divert Iraqi forces from the Coalition main attack and to fix Iraqi forces in eastern Kuwait and along the Kuwaiti coast.
>
> Among the activities planned to support the deception were Navy feints and demonstrations in the northern Persian Gulf, Marine landing exercises along the Gulf and Omani coasts, positioning of a large amphibious task force in the Gulf, and air refueling and training activity surges that desensitized the Iraqis to the real pre-attack buildup. This impression was to be reinforced by USMC and Joint Forces East operations south of Kuwait. . . . Raids and some SOF activities were expected to contribute to Saddam Hussein's confusion as to the most likely location for the main attack.[34]

On "G-Day" (the first day of the ground war), the BBC broadcast the news that coalition forces were storming the beaches of Kuwait and had established a lodgment despite heavy losses. Safely ensconced on their ships, the embarked Marines listened in amusement as the radio announcer solemnly transmitted this remarkable news. While the Iraqi high command presumably reacted to the announcement of the expected Marine invasion, the allied main effort swept easily into the desert on the enemy's open right flank. The following morning, the 5th Marine Expeditionary Brigade landed peacefully on undefended beaches

and joined in the pursuit of the tattered Iraqi forces into Kuwait City.

At face value, this recent example of an American-led Coalition exploiting an adversary's preconceptions as part of a deliberate, overarching deception plan apparently refutes the original thesis of this paper—that the capacity of U.S. commanders to understand and exploit enemy preconceptions, as well as the ability of their supporting intelligence staffs to facilitate this exploitation, is problematic at best. However, all may not be as it seems. The authors of the Defense Department's postwar report portray a picture of rational, premeditated deception planning and execution. Not surprisingly, the euphoria associated with the decisive victory in the Gulf may have colored these conclusions and allowed some of the more tenuous assertions to pass without proper scrutiny. The initial, extremely overoptimistic estimates regarding the effectiveness of allied airborne precision strike munitions and Patriot missile defense systems serve as two concrete examples of this tendency. In this case, a careful review of the decisions leading up to G-Day (February 24, 1991) reveals that the amphibious feint, far from being a carefully conceived, deliberate planning decision made months before the event (as portrayed in the Pentagon's report), actually was not made by General Schwarzkopf until February 2 during a meeting with his top Naval and Marine commanders.[35] Furthermore, the decision apparently had less to do with deception than it did with the immense operational difficulties (mines) and severe risks (Marine and Kuwati civilian casualties) associated with an amphibious assault. In their work *The Gulf Conflict*, Lawrence Freedman and Efraim Karsh make it clear that the decision not to invade was made at almost the last minute and only then when it was determined that the "risk did not seem

worth the potential military gain."[36] Whether by accident or design, this recent example illustrates the continued validity of using enemy preconceptions to define one's operational deception plan. Handel summarizes:

> After all, human nature cannot be expected to change; and since most deception operations are designed to reinforce the existing beliefs and perceptions of the deceived, successful deception will continue to be an important factor in war.[37]

At a time when the United States stands as the world's only global power, it is more important than ever that American operational commanders and intelligence personnel, from the service to the national level, be "more open to evidence and ideas that are at variance with our preconceptions."[38] During the Cold War, we were able to focus our efforts on one potential foe, and we had the benefit of 40 years of trial and error to sharpen our preconceptions about that foe's capability and intent. Today, we could face an entirely new set of variables and circumstances and have very little time to assimilate the new information. For example, what role did our preconceptions play in our failure in Somalia? We presumed that hungry people wanted to be helped because *we* certainly would, given the same circumstances. Unfortunately, this presumption did not exactly fit with the reality in Somalia. Perhaps more importantly, how accurate are our preconceptions of North Korea and its current economic decline, or of China and its desire to "unify" the country by assimilating Taiwan, or of Bosnia, Serbia, and Croatia and their desire for long-term peace? If we are to refute the observation of the Comte de Paris that "the American mind is slow to grasp an idea to which it is not accustomed to beforehand,"[39] we must do

so with an understanding of the critical role of preconception in military deception operations.

Notes

1. Michael Handel, *War, Strategy, and Intelligence* (London: Frank Cass and Co., 1989), 342.

2. According to Joint Pub 1-02, *DOD Dictionary of Military and Associated Terms,* **military deception** is defined as actions executed to deliberately mislead adversary military decision makers as to friendly military capabilities, intentions, and operations, thereby causing the adversary to take specific actions (or no action) that will contribute to the accomplishment of the friendly mission.

3. Ibid, 37.

4. M. Vego, "Operational Functions," unpublished paper, Joint Military Operations Department (Newport, RI: U.S. Naval War College, August 1996), 21.

5. T. L. Cubbage, "German Misapprehensions Regarding Overlord: Understanding Failure in the Estimative Process," in *Strategic and Operational Deception in the Second World War,* ed. Michael Handel (London: Frank Cass and Co., 1987), 118, 125.

6. Ibid.

7. Ibid.

8. Ibid.

9. Ibid, 127.

10. Ibid.

11. Ibid, 134.

12. Morgan Hunt, *The Story of Psychology* (New York: Doubleday, 1993), 406.

13. Ibid., 407.

14. Cubbage, 134.

15. Richards J. Heuer, Jr., "Strategic Deception: A Psychological Perspective," 21st Annual Convention of the International Studies Association (Los Angeles, CA: March 1980), 45, quoted in Handel, 334.

16. Ibid., 341.
17. Ibid., 339.
18. Yigal Sheffy, "Institutionalized Deception and Perception Reinforcement: Allenby's Campaigns in Palestine," extract from *Intelligence and Military Operations*, Instructional Research Package (Manassas, VA: American Military University, 1996), 175.
19. Ibid, 203.
20. Ibid., 206
21. Vego, 21-22.
22. E. B. Potter, ed., *Sea Power: A Naval History* (Englewood Cliffs, NJ: Prentice Hall, 1960), 784.
23. Cubbage, 134.
24. Vego, 22. Professor Vego references Lanning Porter's work *Preconceptions, Predilections, and Experience: Problems for Operational Level Intelligence and Decisionmaking* (Ft. Leavenworth, KS: School of Advanced Military Studies, U. S. Army Command and General Staff College, May 12, 1986), 5.
25. Joint Pub 3-58: *Joint Doctrine for Military Deception* (Washington, DC: Government Printing Office, May 31, 1996).
26. According to Joint Pub 1-02, *DOD Dictionary of Military and Associated Terms,* **perception management** is defined as actions to convey and/or deny selected information indicators to foreign audiences to influence their emotions, motives, and objective reasoning; and to intelligence systems and leaders at all levels to influence official estimates, ultimately resulting in foreign behaviors and official actions favorable to the originator's objectives; **preconception** is defined as the prepossessed notions, ideas, and beliefs held by adversary leadership and intelligence analysts with respect to the friendly mission, capabilities, and intentions.
27. Ibid., IV-2 and IV-3..
28. Ibid., A-2.
29. Field Manual 90-2: *Battlefield Deception* (Washington, DC: Department of the Army, October 3, 1988).
30. Ibid., 3.

31. Ibid., 3-4.
32. Ibid., 1.
33. Ibid.
34. Extract from DOD Final Report to Congress, "Conduct of the Persian Gulf War," April 1992, as quoted in Joint Pub 3-58, IV-2.
35. Lawrence Freedman and Efraim Karsh, *The Gulf Conflict: Diplomacy and War in the New World Order* (Princeton, NJ: Princeton University Press, 1993), 391.
36. Ibid., 392.
37. Handel, *War, Strategy, and Intelligence*, 39.
38. Heuer, 45, quoted in Handel, 334.
39. Stephen W. Sears, *To the Gates of Richmond: The Peninsula Campaign* (New York: Ticknor and Fields, 1992), 67.

Airpower, Chaos, and Infrastructure: Lords of the Rings

EDWARD J. FELKER

A Guiding Vision for Airpower

Airpower theorists have long studied how airpower shapes battlefields and kills tanks. If the Air Force accepts its basic doctrinal tenets of flexibility and versatility to exploit mass and maneuver simultaneously at any level of warfare, however, then airpower's range, speed, reach, and lethality should have far greater impact at operational and strategic levels than at tactical levels. This does not abandon airpower's impact on the ground scheme of maneuver—but that should not be its only focus.

The enemy determines its centers of gravity (COGs), not those who study them. We need to understand how to degrade the adversaries' ability to transmit their military, political, and economic goods, services, and information. This is airpower's best contribution toward achieving operational and strategic

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aims. Infrastructure, to include both traditional and emerging lines of communication, presents increasingly lucrative targets for airpower. In an age dominated by information, fraught with uncertainty, and laced with a healthy dose of the unknown, airmen need a vision to guide airpower's practical application. Thus the need exists to study airpower's ability to impact the lines of communication that will increasingly define modern societies by synthesizing portions of the ideas of John Warden, Antoine-Henri Jomini, and chaos theory.

Infrastructure

During the Cold War, Allied Air Forces Central Europe (AAFCE) studied the Warsaw Pact fuel system and rejected it as a viable target.[1] AAFCE treated the destruction of the fuel infrastructure *form*, rather than its exploitation as a necessary *process* within Soviet military doctrine. AAFCE planners were captured by the paradigm of regarding fuel as a single target set of far more aimpoints than could reasonably be attacked by airpower.

In the mid-1980s, Air Force *Checkmate* restudied this fuel system. By viewing it as a link between Soviet military doctrine and the commander's operational objectives, 10 critical and vulnerable Army-level fuel supply nodes emerged. These nodes contained approximately 40 aimpoints that could disrupt operational level fuel flow, thereby negating Soviet planned breakthrough operations. The sortie count to achieve this disruption changed from AAFCE's original "several thousand" to a more manageable 150.

This example dramatizes infrastructure as a dynamic system. Put simply, infrastructure binds a society because it carries its political, military, and economic communications: goods,

services, and information. Infrastructure becomes a COG because it serves as *form* and *function*. Bridges, highways, railroad tracks, and fiber optic cables with their corresponding trucks, trains, and servers constitute *form*. But form is secondary to the *processes* or functions these components of infrastructure routinely engage—communications.

Societal Structure and Lines of Communication

To understand how airpower can contribute to achieving strategic and operational aims, one must begin by understanding the adversary's society and culture. Alvin and Heidi Toffler observed, "The way we make war reflects the way we make wealth," thus identifying First Wave (agrarian), Second Wave (industrial), and Third Wave (informational) societies.[2]

The Toffler's Societal Model

First Wave agrarian civilizations are a product of the agricultural revolution whose *leitmotiv*[3] is subsistence and survival. Its infrastructure is pre-industrial, heavily dependent on agricultural goods, and reliant on other societies for materials and markets. Societal structure is concentrated on a handful of resources, a stunted manufacturing sector, and underdeveloped services.[4] First Wave warfare pits force against force in a conflict over possessions. It bears an unmistakable agrarian stamp, not so much in technology, but in organization, communication, logistics, and administration, as well as in reward structures, leadership styles, and cultural assumptions. Agrarian societies are difficult to coerce with airpower because they lack well-developed infrastructure links that can be exploited.

Second Wave societies are industrial and marked by large quantities of labor and mass production. Industrialization results

in greater connectivity between production and consumption. Through imports and exports, these societies become more globally connected. This vast connectivity forms an infrastructure based on the production and control of goods, services, and information. Mass production, bureaucracy, and tangible value are the underpinnings of wealth. Infrastructure links are concentrated on the logistics of wealth.[5] Second Wave warfare's main feature is mass destruction of industrial powers.

In Third Wave societies, knowledge—data, information, images, symbols, culture, ideology, and values—is the central resource of the economy. These societies reduce the mass associated with the Second Wave, yet create wealth in exponential quantity. The right knowledge reduces labor, inventory, energy, and raw materials, as well as the time, money, and space necessary to produce wealth. Third Wave societies build new infrastructure links inside and outside their societies based on accumulating knowledge. The finite amount of land, labor, raw materials, and capital is replaced by the quest for inexhaustible knowledge. Mass production is replaced by demassification that also flattens the leadership hierarchies while simultaneously dispersing and networking industrial plant and leadership.

In Third Wave societies, economies of scale are frequently outweighed by "diseconomies" of complexity. Rising complexity necessitates a high order of systemic integration in the infrastructure that links the society together. A vast informational network replaces much of the Second Wave infrastructure.[6] Third Wave societies evolve into externally hyperconnected communities. Paradoxically, the most powerful societies like the United States, Japan, and Europe need the most links because they become interdependent with the outside world to sustain their advanced economies. This amounts to what the

Tofflers describe as a "monumental change in how wealth is created" and, for our purposes, an equally remarkable change in how war is waged.[7]

The Gulf War can be regarded as a precursor of Third Wave warfare. It emphasized precision targeting rather than mass destruction, operational effectiveness based on the transfer of massive quantities of information, and information dominance to elude the enemy's ability to observe, orient, decide, and act—John Boyd coined "OODA loop" to describe this cycle of perception, decision, and action.[8] He contends that an organism observes and orients itself to succeed by adapting and shaping the environment to its own ends. The environment is not inert, but adaptive in its own right; however, it is bounded but unpredictable and highly sensitive to small variations in initial conditions.

Understanding societal structure is crucial to discerning the processes that underpin it, and where vulnerabilities might be exploited. The Tofflers provide a good model to relate culture, the production of wealth (economics), and warfare. Third Wave societies transmit their wealth as communications that carry the society's goods, services, and information; infrastructure then circumscribes the process for distributing a society's communications whose lines are defined by geography and culture. Hence, communications are as much the function of values as geography.

Defining Lines of Communication

Joint Publication 3-0: *Operations* describes lines of communication as "all the routes, land, water, and air, which connect an operating military force with a base of operations and along which supplies and military forces move," a subset of "Lines of

operation . . . the directional orientation of the force in time and space in relation to the enemy . . . that connects the force with its base of operations and its objectives."[9] This distinction implies the lines possess a three-dimensional quality and are more than physical because they also connect force with objectives.

But this definitional landscape splits hairs over *form* and *process*. A better and more relevant definition of lines of communications is the infrastructure for the transmission (to include collecting, processing, analyzing, and disseminating) of all forms of goods, services, and information. This definition makes no distinction among military, economic, political, or cultural lines of communication and makes implicit the integration of all societal infrastructure within the definition.

Jomini's Lines of Communication

Swiss military theorist Antoine-Henri Jomini provides an exposition of military force focused on infrastructure. He notes that strategy is the key to warfare; strategy is controlled by invariable scientific principles; and these principles describe offensive action to mass forces against weaker forces at some decisive point. Jomini describes these decisive points in geographical terms: a road junction, river crossing, mountain pass, supply base, or an open flank. Without exception, enemy dispositions and supply lines define decisive points within Jomini's construct.[10] Jomini transforms war's intellectual component into operational art. Lines of communication have physical characteristics; however, they also portend strategic choice. His theory attempts to provide an operational template to describe where to fight, for what purpose, and with what force.[11]

Jomini reinforces the importance of infrastructure.[12] He is less concerned with their characteristics than with the total strategic and operational value of the infrastructure within how a commander conducted warfare. Making the proper strategic choice is not a matter of servicing specific targets; choices are made for operational and strategic decisiveness. In much the same manner as John Boyd's OODA loop, Jomini describes a construct for commanders to apply decisive, aggressive, offensive action to deprive the enemy "time to think and act, with superior force at the time and place of battle as the best guarantee of victory."[13]

Chaos Theory, Warden, and Infrastructure

Contrary to its name, chaos theory studies sequential events in perceived chaotic behaviors in the hope of finding order. Scientific and mathematical literature defines chaos theory as "the science of complex, dynamic nonlinear systems (and) since organizations are complex, dynamic systems, chaos is the science of organization." [14] The theory lies at the ill-defined, somewhat arbitrary border between mathematics and physics (and for some critics, alchemy).

Chaos theory applies to *dynamic systems* with a large number of shifting, interconnecting, and interrelated component parts.[15] Within these dynamic systems, nonperiodic order exists—that is, seemingly random data that yield orderly yet nonrecurrent patterns. Even though the patterns may appear repetitive, they are not. Weather patterns illustrate this principle. At a given location, weather cycles through well-defined seasonal changes; however, from year to year the cycles vary.

Such *chaotic systems* exhibit sensitive dependence upon initial conditions. A slight change in the initial inputs leads to dispro-

portionately divergent outcomes.[16] This principle is most important for military planners. Small changes or perturbations may result in very different and sometimes unpredictable behaviors at later times. If order exists at all, it suggests that patterns can be predicted in at least weakly chaotic systems.[17]

Complex system structures exhibit patterns formed by an iterative process of *self-similarity*; in other words, small pieces of the structure are similar to the overall shape from which they came. If a branch of a cauliflower head were dissected, the smaller piece would look very similar to the whole. The iterative process uses the output as the next input. Each input is further dissected into its iterative output and possesses the self-similarity of its corresponding input.[18]

Chaos draws a fine line between the predictable and unpredictable. Initial conditions are sensitive and popularized as the "butterfly effect,"[19] where a butterfly flapping its wings over Brazil can spawn a hurricane in the Caribbean Sea.[20] This means small changes may result in very different behaviors at later times; however, it might be possible to place bounds on a range of behaviors if they are weakly chaotic. We can then make assertions about the future states that the system might pass through, even though we cannot exactly predict the form of those states.

Linear systems have proportional inputs and outputs; if input doubles, output doubles. Second, linear systems obey the superposition rule—several simultaneously applied inputs to a system yield an output whose total equals the sum of the inputs. Proportionality and superposition give linear systems their predictable behavior.

We tend to treat most systems as if they were linear. A factory is a good example. We predict that if we add people or

inventory, output will increase by a comparable amount. What goes into the system should be a predictor of what comes out. But in reality factories do not operate this way because they are nonlinear systems and do not display proportionality and superposition. Change the number of people, inventory, etc., and a widely differing output might occur, far from what we predicted. Small inputs may yield huge outputs, depending upon the nature of the system.[21]

The subsystems that organize a society—leadership, command and control, finance and banking, telecommunications, etc.—also form systems. Each system or subsystem is more or less vulnerable to internal and external disturbances. Many of the systems and subsystems are interconnected and interact with each other. These links define the normal operation of the system and convey nonlinear, chaotic processes. Disturbances in one subsystem may have effects on the system that are completely out of proportion to the disturbances, or may ripple through the entire system via direct and indirect links, thus affecting other subsystems.[22] An understanding of chaos allows us to find bounds or patterns within systems that appear to be unpredictable. Crucial to applying chaos theory to warfare is a comprehension of the enemy's culture, its systems, subsystems, links, and critical vulnerabilities.

Chaos and order are not opposites. They are rather *ying* and *yang*, inseparably intertwined. Chaos theory is a conceptual device for describing an incredibly complex world and provides a powerful "navigational" tool to perceive the conditions on the edges of chaos.

Warfare on the Edge of Chaos

If a society at war were perceived as a chaotic system, then the application of force is an input and corresponding behavior an outcome. The unpredictability of outcome defines nonlinearity. Alan Beyerchen points out that war is inherently nonlinear and that its character changes in ways that continually alter the political ends that guide war:

> We can never recover the precise initial conditions even of known developments in past wars, much less developments in current wars distorted by the fog of uncertainty. Interactions at every scale . . . between adversaries amplify microcauses and produce unexpected macroeffects.[23]

In general, most military theorists assume that given enough information, outcomes become predictable and courses of actions can be generated to meet objectives.[24] Emergent behavior is an important characteristic of chaotic systems.[25] Interactions within the system can lead to emerging global properties strikingly different from the behaviors of the individual subsystems. These global properties are impossible to predict and affect the entire environment, thereby influencing their behavior. A synergistic feedback loop forms such that the interactions among the subsystems determine the global properties, which in turn influence the subsystems themselves. Each subsystem exhibits its own emergent behavior and in turn influences the global behavior of the entire system.[26]

This emergent behavior pattern implies that reductionist analysis has limits. As an analyst attempts to deconstruct the system, the analysis usually focuses on the properties of the pieces, rather than the dynamics of the system.[27] But by studying the parts instead of the system as a whole, global properties are

lost. The blurring of emergent behavior occurs because the global properties are functions of the interaction among the subsystems and their effects. This is what occurred in the Allied Air Forces Central Europe's study of Soviet fuel. The global property of the fuel system was lost because the planners focused on the characteristics of the storage sites (subsystems), not the interaction of the components of an entire system (conceptual framework of Soviet military doctrine). *Checkmate* instead applied a holistic approach to include the interaction of the subsystems and the global properties. The result was a nodal analysis that did not treat the subsystems in isolation but focused on the global properties of the entire system.

This point is crucial in understanding chaos theory's contribution to armed conflict, because "war is . . . an act of force to compel the enemy to do our will."[28] The target and timing of attack should be designed to trigger a mechanism that precipitates a desired outcome. If the global properties of the enemy system are not considered, then the specific results will probably not occur. At worst, the connection between the desired outcome and the attack breaks; at best, the outcome is blurred because the system's complex behavior cannot be assessed against the input. The *Rolling Thunder* campaign in the Vietnam conflict illustrates this point.

Rolling Thunder was an air interdiction campaign designed to cut off the insurgent Vietcong in the South from North Vietnamese support. The primary targets were transportation, storage, and some North Vietnamese industrial plants.[29] One reason for *Rolling Thunder's* failure was that the planners misidentified an infrastructure link between the North Vietnamese and the Vietcong in the south. The actual link was between the source of the Vietcong's power (the society of the south) and

their cultural and ideological force, not North Vietnam. Rather than relying on infrastructure, the Vietcong derived their power from socialization, ideology, politicization, and "family." North Vietnam could not be coerced by airpower during the southern insurgent phase because there was no northern infrastructure linking them to the southern Vietcong.[30] Later, *Linebacker I* and *II* were more successful at coercing North Vietnam because the southern insurgent (First Wave) war subsided and transitioned into northern Second Wave warfare. Once the North Vietnamese became reliant on their infrastructure links of communication, transportation, logistics, and command and control, airpower coerced North Vietnamese emergent behavior and its global properties. [31]

Chaos theory suggests that some systems are unpredictable, so gathering more information to improve prediction is impossible and becomes counterproductive when it creates a false sense of security.[32] As we explore what information dominance means in the future, we must understand that perfect situational awareness is an illusion.[33] Enhanced technology might help pierce the fog of war, but it will never eliminate it. Complexity emphasizes structure and behavior, with neither being 100 percent predictable. Information dominance says that comprehensive situational awareness will locate the target, establish targeting parameters, and gauge the effectiveness of the attack and its impact on the enemy. To wage information warfare to its fullest, military planners will have to develop a better understanding of how cultures are linked and where those links are most vulnerable. Since initial conditions and behavior are unpredictable, endstates are also unpredictable. While the *form* of the complex, adaptive systems may be ill defined, its *processes* do have structure.[34]

Figure 1 illustrates how chaos theory might be relevant to military planners. Because chaos theory can only approximate reality because initial conditions are never known and endstates are unpredictable, the *processes* that link subsystems are more important than their *form*.

Figure 1.

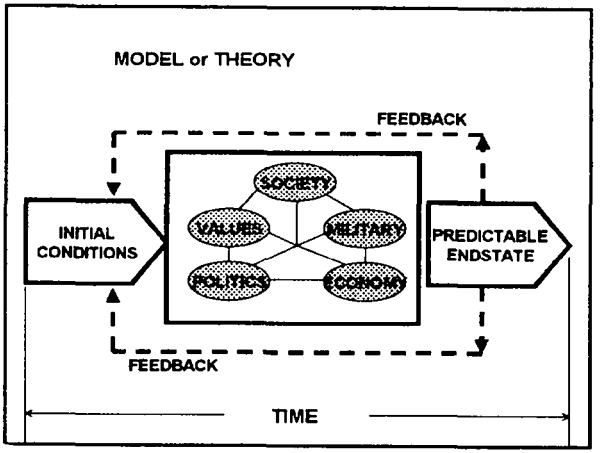


Figure 1 depicts a factor overlooked by early airpower theorists. War occurs between and within societies; therefore to understand war, one must understand societal structures. A society's structure is based on the processes that link its elements of power. Initial conditions become endstates as a result of the interactions among the societal linking processes. These *processes* are illustrated above as the lines that connect the various subsystems of the society. This weblike network forms an infrastructure that binds a society together. Any theory of airpower that overlooks or omits the societal and cultural elements underlying the value system of the adversary is inherently

incomplete. The World War II Combined Bomber Offensive in Europe serves as an example.

The *Strategic Bombing Survey* from the European war noted that careful selection of targets for air attack should have emphasized the German experience. It concluded:

> The Germans were far more concerned over attacks on one or more of their basic industries and services—their oil, chemical, or steel industries or their power or transportation network—than they were over attacks on their armament industry or the city areas. The most serious attacks were those which destroyed the industry or service which most indispensably served other industries.[35]

This observation runs exactly counter to the Allied Combined Bomber Offensive, the priority of which was German war production.[36] The Allies had failed to identify the infrastructure deemed indispensable by the adversarial culture because the information on the "German economy . . . at the outset of the war was inadequate."[37]

The *Strategic Bombing Survey* reinforces the logic of considering society and culture. Without describing *processes*, only target *form* is defined, that is, specific targets: switching nodes, telephone exchanges, computer networks, bridges, chokepoints, etc. We would have a comprehensive target set, but we would have little understanding of what any given target contributes to the process that links various systems. To impact society's decisionmaking, we need to affect its *process*, not simply attack its *form*. A theory focused on *process* leads to target selections in specific situations relevant to the interrelations of the sub-systems of the adversary's systems. Key targets are based on an adversary's power structure and system linkage. As such, a

practical theory is culture-bound, because culture determines the system value, *form*, and *process*. By combining elements of John Warden's third strategic ring, chaos, and Jomini we can develop a theory of airpower that is infrastructure centered, operational and strategic COG driven, and culturally determined.

Infrastructure: Warden's Third Strategic Ring

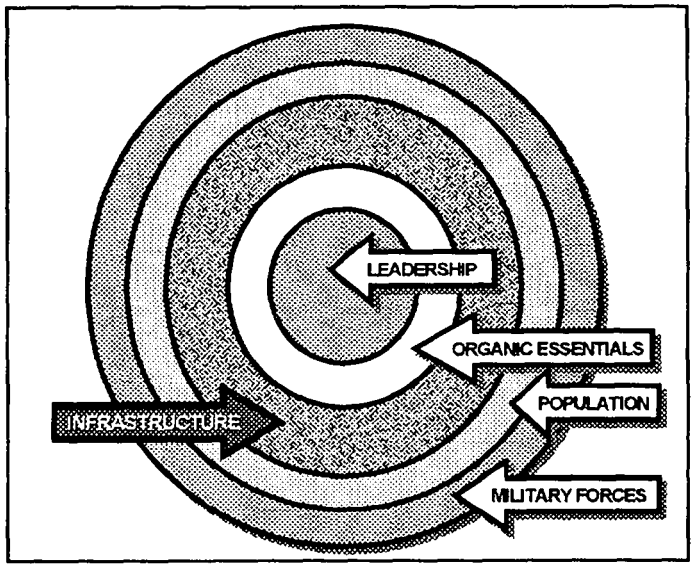
John A. Warden, who wrote *The Air Campaign*, focused his thesis on COGs and interdiction.[38] He advocated that airpower's inherent speed, range, and flexibility allowed it to extend beyond the battle to strike an enemy in a swift and decisive manner.[39] Although Warden's thesis discussed the importance of COGs, it lacked a conceptual model. In 1988, he began work on an organizing scheme to explain his thesis and produced a model formed by five concentric rings.

Warden's five-ring model views the enemy as a hierarchical system composed of five subsystems: leadership, organic essentials, infrastructure, population, and fielded military forces.[40] According to Warden, criticality decreases as one moves outward, with the least critical ring being fielded military forces. Within each ring is a collection of COGs that, when neutralized, causes a particular ring to cease functioning. Other rings are affected depending on whether the subsystem destroyed is an inner or outer ring. Herein lies one of Warden's greatest weaknesses. Rather than a separate and independent ring, infrastructure permeates the entire system. An inner ring may not directly affect the outcome of an outer ring. Perhaps it is the infrastructure that binds the entire system and is the mechanism for the interdependence of all the rings.

Warden's central theme is that airpower's most effective use is against leadership. In practicality, one is left asking: "What is

a leadership target? Can leadership be affected in ways other than direct attack? If infrastructure links the subsystems, might it be the most important target?" Although Warden's theory is compelling in its focus on the mind of the leader, that may not always be the most important target.

Figure 2.



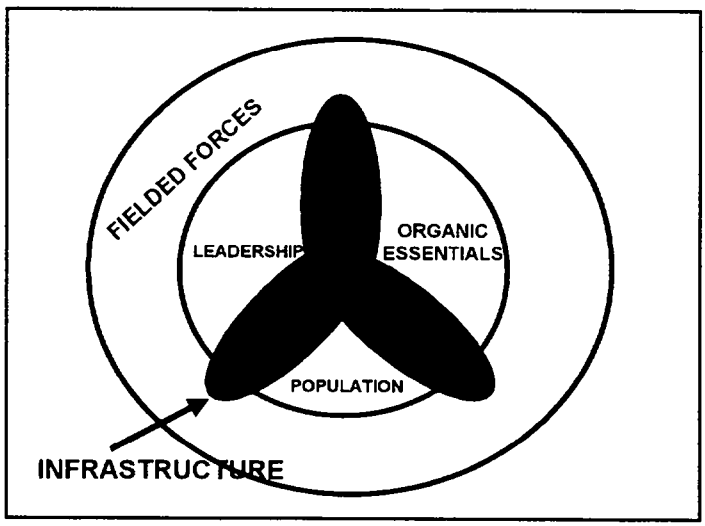
Reformulating Warden's Model

Warden's model explicitly neglects how infrastructure might be the mechanism by which coercion occurs. He portrays each subring as possessing the same structure as the overall model (five internal rings) and implicitly hints the rings are related through this link. In fact, linkage is probably made through the infrastructure comprising each of these subsystems.[41] This infrastructure includes command and control, transportation,

communications, logistics, etc. Rather than a separate infrastructure ring, the other four rings become interconnected through their infrastructure. With the debate over Warden's theory focused on the first ring (leadership) versus fifth ring (fielded forces), infrastructure (third ring) as a complex system linkage is lost. Also lost is Warden's potential utility for Third Wave warfare.

Figure 3 offers an alternative to Warden's model. A three-segment ring comprises society (population, organic essentials, and leadership). These three subsystems are interrelated in much the same way as Warden's model; however, they are not hierarchical because the new model depicts Third Wave warfare, not Warden's Second Wave hierarchical targeting. Surrounding the core subsystems of society are the fielded military forces that protect the others from outside influence. In the center is a dark area that represents the society's infrastructure that links every subsystem of the society.

Figure 3.



The infrastructure depicted binds every subsystem of its society in an interrelated structure. Chaos theory explains the mechanics of the infrastructure. Attacking infrastructure in any specific subsystem can have effects on other subsystems; for example, attacking a fiber optic network node can simultaneously impact banking, industrial production, and telecommunications (organic essentials); military command and control, intelligence dissemination, and logistics databases (military forces); and communications, strategic intelligence, and propaganda production (leadership). Already effective in Second Wave warfare, attacking infrastructure in Third Wave warfare may be the best alternative because leadership is flattened and dispersed; organic essentials are scaled down and dispersed; population is beneath our scruples to attack directly; and military forces are First Wave, are out of fashion, and fight back.

A final element of Warden's theory is that of *parallel attack*. After understanding the enemy as a system, the problem becomes one of reducing the enemy to the desired level or paralysis. Warden notes that the number of vital targets obtained by studying the enemy system is relatively small, and if struck in parallel (near simultaneously), damage to the enemy becomes insuperable. As one studies this idea in greater detail, one sees its application is directly related to the transmission of the society's goods, services, and information—its lines of communication. Loss of important infrastructure may become what matters most.

A Different Approach for Airpower

Understanding the nature of cultural patterns can provide insight into the dynamics of the systems comprising the culture. Chaos theory helps reduce the fog and friction, understand uncertainties, and bound the range of future outcomes in

employing military force. But research into chaos is relatively new. More importantly, application of chaos to the military planning process is even more recent—yet, history does provide a window to explore new ideas for the future.

Three Examples of Airpower, Chaos, and Infrastructure

World War II Campaign Against German Transportation. In the 1930s, the Air Corps Tactical School (ACTS) developed a strategic bombing theory known as the "industrial web." Led by Harold George, Don Wilson, and a handful of other faculty, ACTS focused on a belief that economies were intricate and interconnected entities and rested on certain basic industries (transportation, steel, iron ore, and electrical power). Destroying the threads in this "web" would unravel the economic and social fabric of an adversary. The subsequent collapse of national morale and economic means of waging war would bring about the capitulation of the adversary.[42] On the surface, this is also John Warden's worldview. Paradoxically, he and many other air planners treat the interconnections among the elements of a society as secondary in importance to the things connected. Many airpower enthusiasts dissected elements of a society into component parts and targeted each in isolation from the global properties of the system.[43]

During World War II, once industries were identified, the planning focused on destroying individual target sets rather than key interconnected links. *Air War Plans Document* (AWPD) 1 and 42 identified the German electrical power system, transportation, petroleum and synthetic oil, and morale for air attack.[44] Air Corps planners in Europe believed destroying synthetic oil and selected military industry (airframe, aircraft engine, and ball bearings) would collapse Germany's ability to support the war.

The targets identified within AWPD 1 and 42 came from a study of New York City that ACTS mirror-imaged onto Germany.[45] Both plans provided great detail on individual targets, but rarely was the effect of attacking one viewed in light of its impact on another. When one system failed to yield the desired results, priorities shifted to another target.[46] The targeting of the German rail transportation is a case in point.

Air Marshall Tedder believed transportation was Germany's "Achilles' heel"; however, transportation was a secondary target for radar bombing when weather was bad. In winter 1945, weather was generally bad on the European continent, and German railroads were bombed extensively. Rail transportation turned out to be vital for both military and economic reasons, although the Allies did not realize it at the time.[47]

The sustained bombing against rail marshaling yards paralyzed Germany's ability to deliver bulk coal. This degraded electrical power production and coke manufacturing for steel and halted aluminum and copper production. When the trains stopped, German war industry could not ship supplies to where they were most needed, especially on the Eastern Front, and lateral reinforcement was almost impossible. Civilian morale suffered because heating fuel was scarce and trains could not be sent to southeastern Europe for the grain harvests. These were unintended consequences because air planners had focused only on the *form* of the German rail system rather than its *process* of linking population, fielded forces, and organic essentials.[48]

World War II Aerial Mining Campaign of the Japanese Home Waters. The Allied aerial minelaying in Japan's home waters (Operation *Starvation*) in 1945 allows us to explore other unintended consequences of airpower, chaos, and infrastructure. In mid-summer, 1944, Admiral Nimitz's staff developed a plan

to use B-29s to mine Japanese home waters, believing that aerial mining would starve Japan's industry and population, thereby fatally weakening Japan's will to continue the war.[49] The plan's objectives were to stop raw materials and food from reaching Japan, prevent the supply and deployment of Japanese forces, and disrupt maritime transportation within the Inland Sea.[50] Without a formal understanding of chaos, the planners had defined a complex system (Japanese population and industry) that was vulnerable to airpower (B-29 aerial mining) against infrastructure (Japanese maritime shipping) to achieve a strategic aim (weaken Japan's will). Generals Arnold and Hansell were opposed to the plan. They saw aerial mining as another diversion of strategic airpower from its primary mission—strategic bombardment of industry and population.[51] They viewed aerial mining within the narrow paradigm of individual target *form*, rather than in the context of *process* within a complex system to achieve strategic aims.[52]

The *Strategic Bombing Survey* concluded that "mines, perhaps more than any other weapon of equal accomplishment, were orphans during the war."[53] To most airmen, a mine was effective only in sinking a ship (an independent tactical event). Bombing industrial and population centers was the most attractive use of strategic airpower. Airmen understood that by 1945 Japanese industry had dispersed as a result of strategic bombing (Third Wave effect from Second Wave course of action). In fact, this was the rationale used to justify incendiary bombing of the cities. What planners did not understand was this dispersal also made the Japanese critically dependent on traffic from their inland seaports. Bombing a dispersed manufacturing base became irrelevant if raw materials were unavailable. Airmen were unable

to discern the infrastructure link that determined this segment of Japanese culture.

Operation *Starvation* began on March 27 and ended August 14, 1945.[54] The outcome included operational and strategic effects never considered by the planners. The *Strategoc Bombing Survey* noted that

> Among the most significant contributions of Army air in the strategic war against merchant shipping [because it] reduced the remaining merchant shipping, virtually closed the vital Shimonoseki Strait and ports not accessible to Allied submarines, denied access to repair yards, and threw the administration of shipping into . . . hopeless confusion . . . [and judged aircraft] to be generally superior to other means of laying mines.[55]

Perhaps the most telling analysis of Operation *Starvation* came from postwar interviews. Japan's former Prime Minister, Prince Konoye said that aerial mining operations were as equally effective as the direct B-29 attacks on industry.[56] Takashi Komatsu, director of a Tokyo steel company, stressed that although bombing badly hurt factories, the denial of essential raw materials from the loss of shipping had a greater effect.[57] Captain Kyugo Tamura, a Japanese minesweeping officer, stated, "The result of B-29 mining was so effective against the shipping that it eventually starved the country. I think you could have shortened the war by beginning earlier."[58]

***Desert Storm* Strategic Bombing.** In articulating *Instant Thunder*, planners postulated a series of outcomes that appears to have corrected the oversights of earlier World War II planners. *Instant Thunder* planning contains discrete projections about how various subsystems of the Iraqi society might be linked.

Infrastructure targets were identified and the bounds of emergent behavior were estimated based on successfully striking these targets from the air.[59]

But although the *Instant Thunder* planners speculated on outcome, they forecasted in a relative vacuum. Like World War II planners, *Instant Thunder* planners did not perform detailed systems' analyses of the nature and structure of Iraq's culture. They tried to identify targets that would cut across all the rings of Warden's model to inflict strategic paralysis on the system. The targets they identified possessed form but had no bearing on the processes that bound the society together. As chaos theory suggests, outcomes could not be predicted because the initial conditions and the functioning of the linking processes were unknown. As in prior conflicts, airmen recognized complex interconnections among the elements of a society, but they could not exploit them because the planners did not recognize their interrelationships. The net result of the *Instant Thunder* plan was that targeting and timing were correct because the identified targets were struck and extensively damaged, but the anticipated endstate was not because links between targets and aims were missing or at best misguided.

From the Past, the Future

In the final analysis, airpower theorizing bows to the throne of targeting because you cannot bomb with an idea or a theoretical construct. Rather than considering different elements of a society and their concomitant targets in isolation, we need to approach the application of airpower from a holistic viewpoint. An adversary's society is generally a complex structure, and we need to target it as such.

One might assume that conflict in the future might be conducted at the strategic level and take advantage of American technological capabilities that become increasingly pronounced to provide commensurately greater leverage. If we stay only at the tactical level of attacking military forces, we will make only marginal improvements in our ability to conduct Second Wave warfare. If we strive to impact the adversary's infrastructure in a way that has the greatest strategic and operational effect, we might attain our objectives without the need to engage in widespread and possibly prolonged destructive warfare.

Using Warden's model, fielded forces are a logical object of Second Wave warfare because one cannot "get at" any of the other rings (especially leadership) without first breaking down the nation's military line of defense. World War II in Europe illustrates the point. Eighth Air Force was assigned the task in Operation *Pointblank* (the Combined Bomber Offensive of 1944) to achieve air superiority over Europe as an intermediate objective of the highest priority before either the invasion of Europe or the full weight of the strategic bombing campaign could take effect. [60]

If the Tofflers are correct, Third Wave, parallel, hyperwarfare enables us to bypass, penetrate, and otherwise overcome all or most of the fielded forces to strike directly at other subsystems. We have seen how infrastructure, and especially those links that define the communication of goods, services, and information, might have great operational and strategic effect. In an information age, much of this infrastructure will be information based. Comprehensive situational awareness must be used to complement the twin capabilities of exact intelligence gathered in real time and precision weapons delivered from stealthy platforms. Some targets will be vulnerable to soft-kill mecha-

nisms, such as computer virus attacks to disable a national telephone switching system, intrusive electronic warfare to wipe out an adversary's logistics inventory database, or an electromagnetic pulse to disrupt electronic systems. Regardless of the attack method, infrastructure links provide the best target set to achieve operational and strategic objectives. Targeting for airpower in the future should consider the areas listed in table 1.

The target nodes above were selected based on their potential synergies with the infrastructure of culture. They parallel what might be seen in Second and Third Wave cultures. They do not reflect, however, a universal applicability across every society. Each adversary must be examined within its own cultural context to discern relevant infrastructure. Synergism is the most critical factor in considering any of the listed nodes—for example, a pipeline distribution node might affect transportation, power production, military, population stability (gasoline distribution), and information (telecommunications backup generator fuel) simultaneously. This example illustrates target values in terms of system processes, not in isolated value of the form in a petroleum subsystem.

Conclusion

All societies rely on the movement of goods, services, and information. An infrastructure based on these lines of communications binds the elements of a society together and forms a complex system that responds to self-regulation against disruption. By understanding a culture and its systemic links, we can employ airpower to achieve direct operational and strategic aims.

As airmen moved from theory to practice, isolated and single-focused applications of airpower emerged in the target sets.

These target sets usually focused on *form*, not societal *process*. The problem with this approach was that the target set represented the perceived values of the theorist, not the adversary. The future battlespace will take on new dimensions in mobility, lethality, and scope, but one constant will remain—the strategic aim will continue to serve as the guide for planning.[61] Although speed of the modern battle will surely blur the distinction between sequential and parallel operations, the link between strategic aims and enemy COGs should focus our efforts.

Table 1. Airpower Targeting of Infrastructure Links

POLITICAL INFRASTRUCTURE		
National governmental apparatus: headquarters; command authority; C3 nodes; command posts (mobile/fixed, air/land/sea); and ministry-level offices.	*Internal police and control forces:* internal control agencies ("secret police"); intelligence systems (i.e. SIGINT intercept); internal control databases.	*Propaganda systems:* Propaganda production; public affairs-type organizations; linkages to public diplomacy and area/international telecommunications networks.
INFORMATION INFRASTRUCTURE		
Telecommunications (radio and TV); public and secure switching networks; radio relay facilities; telephone exchanges; fiber optic networks, repeater stations; microwave transmission networks; satellite communications; computer and data processing centers; national C3I centers.		
ECONOMIC INFRASTRUCTURE		
Energy and power production : Transformer stations; distribution nodes; control centers; pump stations; cooling systems; power	*Transportation:* Traffic control; bridges, rail yards, critical interchanges; air traffic control centers; airports; ocean terminals, oil tankers, and offshore	*Financial Centers and Networks:* Institutions (banks, trading centers, etc.); currency controls and depositories; databases for financial management.

transformers and substations; fuel dispensing manifolds; pipelines; distribution terminals; liquid natural gas plants and storage; fuel storage; dispatch centers.	unloading sites; inland waterways; motor trafficking facilities; rail fuel storage; computer and electronic infrastructure; intermodal ties; repair facilities; traffic signal controls; canal locks.	
INDUSTRIAL PRODUCTION INFRASTRUCTURE		
Inventory management systems; computer assisted design facilities; computer-controlled production; robotic assembly systems; automated product distribution systems; production support systems; raw material distribution systems.		
MILITARY INFRASTRUCTURE		
Warning systems and sensors; SATCOM links; control centers and command posts; weapons of mass destruction; intelligence collection, processing, and dissemination; logistics management and databases; force deployment and employment controls; communications and data processing.		

This discussion offers an application of airpower based on understanding the adversary's lines of communications as potentially the most vulnerable links in the structure of its society. Airpower's flexibility and versatility put these lines of communication at risk. If we are ever to achieve information dominance in tomorrow's battlespace, we need to do far more than locate and strike targets in isolation. We must also process knowledge and comprehension of the critical nodes in the enemy's national infrastructure, how its political and other vital systems function, whether these systems possess exploitable vulnerabilities, and how the adversary's informational and other systems work.

Notes

1. Colonel John Warden, the well-known air power theorist, uses this study as the introduction to presentations he gives at Air War College Senior Leadership seminars to show that Air Force thought changed dramatically during the mid-1980s. He cites this study as an example of the break in the old "target servicing" paradigm.

2. Alvin and Heidi Toffler, *War and Anti-War: Survival at the Dawn of the 21st Century* (New York: Little, Brown and Company, 1993), 80.

3. *Leitmotiv* comes from a style that Wagnerian opera uses to repeat a marked melodic phase or figure; in its current vernacular it means a dominant recurring theme.

4. Alvin and Heidi Toffler, 3-25 and 246.

5. Ibid., 38-43

6. Ibid., 57-63.

7. Ibid., 63.

8. Grant T. Hammond, "The Essential Boyd," unpublished paper, (Maxwell Air Force Base, AL: Air War College), 5-9.

9. Joint Publication 3-0: *Operations* (Washington, DC: Government Printing Office, February 1, 1995), III-17.

10. John Shy, "Jomini," in *Makers of Modern Strategy,* ed. Peter Paret (Princeton, NJ: Princeton University Press, 1986), 146, 154, 159.

11. Ibid., 166.

12. Ibid., 167.

13. Ibid., 168.

14. It is beyond the scope of this paper to explain the mathematical theorems contained in chaos theory. In fact, it is beyond the scope of the author's understanding. Chaos theory can be understood in terms of its practical manifestations without understanding its exceptionally complex mathematical underpinnings. See Laurie Fitzgerald, "What is Chaos?" http://www.orgmind.com/ chaos.html, 1.

15. Steven R. Mann, "Chaos Theory and Strategic Thought," *Parameters* 22, no. 3 (Autumn 1992): 54-68. The stock market

illustrates this principle. A look at the daily market indicators demonstrates it is not static. Individual brokers, investors, and the companies whose stocks are traded comprise interrelated subsystems of the stock market system.

16. A *chaotic (or chaordic) system* is defined as a complex and dynamical arrangement of connections between elements forming a unified whole the behavior of which is both simultaneously unpredictable (chaotic) and patterned (orderly). Chaos is the science of such chaotic and orderly, that is, chaordic, entities found in abundance throughout the universe. See Fitzgerald, 1.

17. Uri Merry, "Nonlinear Organizational Dynamics," http://pw2.netcom.com /~nmerry/art2.htm.

18. Edward Ott, *Chaos in Dynamical Systems* (Cambridge MA: Cambridge University Press, 1993), 31-44 and 57-59.

19. James Gleick, *Chaos: Making a New Science* (New York: Penguin Books, 1988), 104.

20. The "Butterfly Effect" is a good example of the paradox of chaos theory. In reality, it seems to be an ambiguity that this effect might occur. The math of the theory shows it *might* be possible for the butterfly to have this effect; however, the null set does not yield a result that says the butterfly *could not possibly* have the effect.

21. Joseph O'Connor, "Thinking Past the Obvious: What is a System?" http/www.radix.net/~crbnblu/assoc/oconnor/ chaptl. htm, 4-8.

22. An electrical power grid provides an excellent example of chaos. The power grid from generation station to transformer substations to customers forms a networked system. This network's exponential branching demonstrates complex scaling. Complexity and underlying order make the system susceptible to failure. If a generator is removed, or some other power isolation occurs, the system attempts to self-regulate to compensate for the power well and frequency droop. Other power suppliers, whether backup systems or outside sources, attempt to take up the slack. If the reserve is insufficient, or the system is already at peak production, the energy well might cause a failure in the entire

grid. Circuit breakers are provided to disconnect the energy well to prevent catastrophic failure. But if the circuit breakers are defective, and/or other power generation stations are taken off line, the energy well and frequency droop can cause a surge or bow wave that also might bring the entire system down. Once this bow wave begins, it is impossible to stop unless the defective part in the system can be quickly located and replaced. Self-regulation keeps the system precariously balanced on the edge of chaos, where any subsequent minute pulse might result in unexpected catastrophic system failure. Conversely, an inadequate reserve allows a wave of dynamically unstable energy to propagate throughout the system and also configure it for failure. The power system is interconnected and interrelated to other systems of the society. Just as the unstable energy propagated throughout the power grid, a catastrophic failure of the power grid can propagate throughout the interrelated systems (transportation, communications, industrial production, computer networks, etc.).

23. Alan Beyerchen, "Clausewitz, Nonlinearity, and the Unpredictability of War," *International Security* 17, no. 3 (Winter 1992/93), 80.

24. Clausewitz shows this to be the essence of why military leaders need theory, "Theory will have fulfilled its main task when it is used to analyze the constituent elements of war, to distinguish precisely what at first sight seems fused, to explain in full the properties of the means employed and to show their probable effects, to define clearly the nature of the ends in view, and to illuminate all phases of warfare in a thorough critical inquiry. Carl von Clausewitz, *On War,* ed. and trans. Michael Howard and Peter Paret (Princeton, NJ: Princeton University Press, 1984), 141.

25. Roger Lewin, "The Right Connections," *New Scientist* 137, no. 1859 (February 1993): 12-13.

26. This spiral of behavior—global properties—can be best seen in the stock market. Interactions among the traders (buying and selling) can prompt global properties (rise and fall of the Dow-Jones Industrial Average). Each trader then interprets the Dow trend and reacts in a

given way. The competition and rivalry among the traders result in an emergent behavior on the part of the system based on the individual perceptions of the global properties. In this case, a market that appears to be selling off stock might result in emergent action on the part of the traders to start buying. See M. Mitchell Waldrop, *Complexity: The Emerging Science at the Edge of Order and Chaos* (New York: Simon and Schuster, 1992), 88.

27. Gregoire Nicolis and Ilya Prigogine, *Exploring Complexity: An Introduction* (New York: W. H. Freeman, 1989), 13.

28. Clausewitz, *On War*, 75.

29. Mark Clodfelter, *The Limits of Airpower: The American Bombing of North Vietnam* (New York: The Free Press, 1989), 102-107.

30. Ibid., 205.

31. Ibid.

32. T. J. Cartwright, "Planning and Chaos Theory," *Journal of American Planning Association* 57, no. 1 (Winter 1991): 44-56.

33. Kenneth Allard, *Command, Control, and the Common Defense* (Washington, DC: National Defense University Press, 1996), 297-299.

34. Cartwright, 53.

35. *U.S. Strategic Bombing Survey Summary* (Maxwell Air Force Base, AL: Air University Press, 1987), 39.

36. Richard G. Davis, *Carl A. Spaatz and the Air War in Europe* (Washington, DC: Center for Air Force History, 1993), 345-352.

37. *U.S. Strategic Bombing Survey Summary*, 39.

38. Clausewitz defines center of gravity as "the hub of all power and movement on which everything depends. That is the point against which all our energies should be directed." See Clausewitz, *On War*, 597-598.

39. John A. Warden III, *The Air Campaign* (Washington, DC: National Defense University Press, 1988), 9, 51-58, and 94-95.

40. John A. Warden III, "The Enemy as a System," *Airpower Journal* 79, no. 1(Spring 1995): 41-55.

41. Ibid., 45-46.

42. Robert T. Finney, *History of the Air Corps Tactical School 1920-1940* (Washington, DC: Center for Air Force History, 1992), 67-68.

43. Guido R. Perera, *History of the Organization and Operations of the Committee of Operations Analysts, 16 November 1942-October 1944*, vol. 2, tab 22 (Maxwell Air Force Base, AL: U.S. Air Force Historical Research Agency), file 118.01.

44. War Department, *Air War Plans Document 1,* tab no. 1, July 9, 1941, 1–6.

45. Air Corps Tactical School, *National Economic Structure* (Maxwell Field, AL, April 5, 1938), 1–12 and *New York Industrial Area* (April 6, 1939), 16–21.

46. Haywood S. Hansell, Jr., *The Air Plan That Defeated Hitler* (Atlanta: Higgins-McArthur/Longino & Porter, 1972), 163-165.

47. Alfred Mierzejewski, *Collapse of the German Economy, (1944–1945): Allied Air Power and the German National Railway* (Chapel Hill, NC: University of North Carolina Press, 1963), 168–176.

48. *U.S. Strategic Bombing Survey*, 37.

49. The operation was named Operation *Starvation* because it intended to strangle what remained of the Japanese sea lines of communication in 1945. The earlier submarine campaign had reduced Japanese maritime shipping capability from 6,823.000 tons at the start of the war to 2,000,000 at the start of Operation *Starvation* . See Wesley Frank Craven, and James Lea Cate, *The Army Air Forces in World War II, vol.5, The Pacific: Matterhorn to Nagasaki, June 1944-August 1945* (Chicago: University of Chicago Press, 1953), 662.

50. Headquarters Twentieth Air Force, A-3, "Starvation: Phase Analysis of Strategic Mining Blockade of the Japanese Empire," 1945, 3, Air Force Historical Research Agency, file no. 760.491-1.

51. Haywood S. Hansell, Jr., *Strategic Air War Against Japan* (Washington, DC: Government Printing Office, 1980), 42.

52. In his memoir, General Arnold wrote how essential it was to mass the maximum number of bombers possible to destroy Japan's war-making capability. He described Admiral Nimitz's desire for B-29s [to aerial mine] as a purely "tactical purpose." See H. H. Arnold, *Global*

Mission (New York: Harper, 1949), 550.

53. *U.S. Strategic Bombing Survey (Pacific War), Naval Analysis Division, The Offensive Minelaying Campaign Against Japan* (Washington, DC: Government Printing Office, November 1, 1946), 25.

54. In all, 1,529 sorties were flown, with 12,135 mines laid in 26 fields on 46 separate missions. XXI Bomber Command lost 15 B-29s (a 1-percent loss rate) while sinking or damaging 670 ships totaling 1,252,256 tons (62.5 percent of shipping existing at that time) See Frederick M. Salagar, *Lessons from an Aerial Mining Campaign (Operation* Starvation*)*, Report R-1322-PR (Santa Monica, CA: RAND Corporation, April 1974), 30; *US Strategic Bombing Survey (Pacific War), Naval Analysis Division, The Offensive Minelaying Campaign*, 1; and Ellis A. Johnson and David A. Katcher, *Mines Against Japan* (Washington, DC: Government Printing Office, 1973), 30.

55. *U.S. Strategic Bombing Survey (Pacific War), Naval Analysis Division, The Offensive Minelaying Campaign*, 9-14, and *U.S. Strategic Bombing Survey, Transportation Division, The War Against Japanese Transportation, 1941-1945,* 8 (Washington, DC: Government Printing Office, 1947).

56. Headquarters Army Air Forces, A-2, *Strategic Effectiveness of Aerial Mine Warfare*, Air Intelligence Division Study no. 131 (Washington, DC: Air Intelligence Division, September 27, 1946), 5.

57. Ibid., 7.

58. Operation *Starvation* was a part of the concurrent submarine and air attack on Japanese merchant shipping. The bombing survey notes that of the 8.9 million tons of merchant shipping sunk or damaged, 54.7 percent was credited to submarines, 30.8 percent to direct air attack, 9.3 percent to mines (largely dropped by B-29s), and the rest to gunfire and accidents. Though the mining contribution seems small, it represented a 4½-month B-29, compared to a 44½-month submarine effort. See *U.S. Strategic Bombing Survey (Pacific War), Naval Analysis Division, The Interrogation of Japanese Officials, vol. 1* (Washington, DC: Government Printing Office, 1946), Interrogation

Nav. No. 26, October 22, 1945, 117; and *U.S. Strategic Bombing Survey, Summary Report (Pacific War)* (Washington, DC: Government Printing Office, July 1, 1946), 11.

59. The *Instant Thunder* plan stated: "Destruction of a few key elements of the Iraqi electric distribution will plunge much of Baghdad into darkness; elimination of half-a-dozen key POL facilities will have immediate effects on the military and civilian sectors; interdiction of several key transportation nodes will impede reinforcement and stop operations of Iraqi forces in Kuwait and along the Iranian border; negating the telecommunications system and Saddam Hussein's internal control forces will isolate him from the populace . . . the psychological impact on the Iraqi populace of being open to remitting air attack will be a powerful reminder of the bankruptcy and impotence of the Saddam Hussein regime . . . when taken in toto, the result of Operation *Instant Thunder* will be the progressive and systemic collapse of Saddam Hussein's entire war machine and despotic regime." It is still unclear what the strategic impact was of the strategic bombing phase of *Desert Storm* actually achieved. The degradation of the Iraqi military forces at the operational level is well documented. The strategic aims as quoted clearly did not occur. See Department of the Air Force, Checkmate, *Proposed Iraq Air Campaign Outline Plan:* Instant Thunder (Maxwell Air Force Base, AL: U.S.Air Force Historical Research Agency, August 16, 1991), file CHSH 1-2, 1-3.

60. Davis, 287-290.

61. *Joint Vision 2010* (Washington, DC: Government Printing Office, July 1995), 13-19.

U.S. Military Expertise for Sale: Private Military Consultants as a Tool of Foreign Policy

BRUCE D. GRANT

New actors in peacetime defense engagement are defense contractors who negotiate agreements directly with foreign governments . . . in such areas as streamlining security assistance, force management, modernization, training, and military transition assistance programs . . . the arrival of such independent parties suggests the direction in which this instrument of U.S. power might travel in the future.
Strategic Assessment 1996[1]

Privatization of U.S. Military Assistance

Should U.S. military expertise be for sale on the foreign market? Traditionally, the United States has provided military assistance to its friends and allies under the broad category of security assistance. Security assistance is defined as programs authorized

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Colonel Bruce D. Grant, USA, shared third place in the 1998 Chairman of the Joint Chiefs of Staff Strategy Essay Competition with this entry, written while attending the U.S. Army War College.

by U.S. law by which we provide defense articles, military training, and other defense-related services by grant, credit, or cash sales in furtherance of national policies and objectives.[2] Since the end of the Cold War, U.S. security assistance has been freed from the constraints of the Cold War's superpower rivalry and has found more prospective clients around the globe, especially in former Eastern bloc countries. Additionally, U.S. success in the Gulf War has served to increase foreign interest in U.S. military doctrine, equipment, and training.

Recently, however, military assistance to foreign nations has taken a fundamentally different form, while at the same time expanding in scope. The U.S. Government has permitted and even encouraged private corporations to conduct the training of other nations' armies for profit. As the U.S. defense budget shrinks, the use of privatized military training abroad is quickly gaining acceptance as another means of conducting foreign policy while avoiding the direct use of American forces. David Isenberg, defense expert and senior research analyst at the Center for Defense Information, observes,

> Simply put, at a time when there is a trend toward military downsizing worldwide, coupled with continuing and perhaps more virulent conflicts in developing nations, a global trend towards privatization, and the reluctance of developed states to intervene in troubled areas, there will be a continuing and possibly increased demand for the services of trained military personnel capable of both teaching combat skills and conducting combat.[3]

The employment of private corporations to provide military assistance, specifically the training of other nations' armies to fight wars, should not be an instrument of U.S. foreign policy.

The military profession should remain a monopoly of the state. Neither Congress nor the public vets, approves, or provides oversight to this new form of security assistance provided under private contract. Freed from traditional, time-tested constraints, foreign policy happens by default initiated by the private business agreement between a foreign government and a corporation. Ultimately, the privatization of U.S. military services under direct foreign contract corrupts our military both in the eyes of society and from within the ranks. The corruption begins with the executive branch permitting profit-motivated organizations, accountable to neither the government at large nor the people, to sell contracted military expertise to foreign entities. This form of privatization removes military expertise from the realm of public accountability and upsets the delicate balance of the remarkable Clausewitzian trinity among the government, the military, and the people. It blurs the lines between a military that works for the state and one that works for profit and sells a precious national resource—the professional expertise of warfighting and managing warfighting by the world's best military.

Unregulated privatized military assistance represents a significant departure from the government-sponsored security assistance programs such as Foreign Military Sales (FMS) and the International Military Education and Training (IMET) program, which have traditionally served as the vehicles for U.S. military assistance. In the new paradigm, private firms provide military training under direct contract with a foreign government rather than a government-to-government agreement associated with traditional security assistance implemented by active-duty military members or closely monitored contracts. These firms train entire armies, beginning with the lowest private to the most senior general, and across the entire spectrum from individual weapons

skills through unit operations to international political-military strategy. The consultants actually teach and supervise a cadre of trainers from a foreign army using knowledge and experience gained from many years of active duty in the U.S. Armed Forces. It is comprehensive training aimed at developing a powerful American-style army.

This privatized military assistance has emerged quietly without much fanfare or publicity and grown through aggressive marketing to meet demand on the international market. Whether through accident or design, the U.S. Government has seized this alternative as an expeditious means to accomplish policy and bypass congressionally mandated law, regulation, and budget as well as the seemingly impenetrable bureaucracy that so often slows traditional security assistance actions.

Traditional Security Assistance Programs

Security assistance is a potent tool of foreign policy that enables the United States to pursue its national interests and shape the international environment. Congressional security assistance legislation provides the legal basis for assistance agreements between the U.S. and foreign countries.[4] Current authority includes both the Foreign Assistance Act of 1961 and the Arms Export Control Act of 1976.[5] Congress limits security assistance through Federal regulations and budget restrictions that prohibit the unlimited provision to foreign powers of military hardware and training. Security assistance programs, coordinated between the State and Defense Departments as well as through the resident U.S. ambassador and country team, receive congressional oversight and public exposure. Of all the security assistance programs, only Foreign Military Sales (FMS) and International Military Education and Training (IMET) specifically provide for

the training of foreign military personnel, training that is now also provided by the U.S. private sector.

Both FMS and IMET programs allowing the export of U.S. military training to foreign nations represent upfront, official commitments of U.S. prestige and policy. Under FMS, the Department of Defense sells training to other nations along with the military hardware or even the training as a commodity itself. For example, the U.S. Government has sold M2 Bradley Fighting Vehicles to Saudi Arabia along with the requisite equipment-related training, which is conducted by private contractors working through the U.S. Government and supervised by Defense Department personnel. Under IMET, the U.S. Congress has recently provided $15 million in funding to the African Crisis Response Initiative to train eight battalions from seven different countries in central Africa to respond to regional hostilities.[6] Government-sponsored security assistance programs such as these represent a clear U.S. foreign policy commitment to very volatile areas of the world.

FMS and IMET security assistance programs promote military-to-military contacts, establish economic ties to the receiving nation, and allow U.S. military access to foreign soil. They enable our allies to better defend themselves against regional threats, preclude the deployment of U.S. forces, and generally enhance the ability of the United States to conduct successful coalition operations when required. For example, during *Desert Storm,* U.S. forces fighting side by side with the Saudis benefitted from relationships forged during the long-standing FMS program with the Saudi Arabian military. Additionally, security assistance complements our diplomatic efforts in shaping the world environment to meet U.S. national interests.

The New Corporate Military Consultants

Who are these new private players in the security assistance arena and what do they do? They are U.S. corporations that can muster thousands of highly experienced former U.S. military personnel with the expertise to train foreign armies. From a U.S. security assistance perspective, these corporations are new actors who negotiate directly with foreign governments to provide specific services.[7] They typically advertise corporate military expertise in such areas as streamlining security assistance, force management, modernization, training, and military transition assistance programs for emerging democracies.[8] Their business relies on recruitment of a highly professional cadre of retired soldiers who provide expertise across the spectrum of military training. The major U.S. firms involved in selling military expertise on the international market include Military Professional Resources, Inc. (MPRI); Science Applications International Corporation (SAIC); BDM International; Booz-Allen & Hamilton, Inc.; and Vinnell Corporation. MPRI, driven by market demand, is perhaps the first to focus on international military training and claims to have "the world's greatest corporate military expertise."[9] Recently included, however, is the capability to train entire armies. In fact, in the last 3 years MPRI has begun to train the armies of other countries to fight wars.[10] The others are relatively large, diverse, transnational corporations that have historically provided technical expertise on military hardware and have expanded their international operations to include military training.

What these corporate military consultants do is market military battlefield skills that either help improve or substitute for regular military forces.[11] In its own words,

> Military Professional Resources, Inc. (MPRI) is a professional services company engaged primarily in military-related contracting in the U.S. and international defense markets. The company's business focus is on military matters, to include training, equipping, force design and management, professional development, concepts and doctrine, organizational and operational requirements, simulation and wargaming operations, humanitarian assistance, quick reaction military contractual support, and democracy transition programs for the military forces of emerging republics.[12]

The kind of comprehensive military training provided by such a firm enables the foreign nation to augment its military capabilities in a short time by training and organizing its armed forces into a more effective combat force and a more potent instrument of power. Furthermore, imparting high-level military skills, conducted by former general and field grade officers under for-profit contracts outside the direct supervision of the Department of Defense (as in FMS and IMET training), marks a fundamental change in the way the United States provides security assistance. This change marks a disturbing trend for the future.

Privatized military assistance to foreign armies as it is evolving, while currently restricted to training, qualifies by definition as a mercenary activity because of the foreign clients to whom it is provided under direct proprietary contract and the for-profit nature of the enterprise. Although corporations such as MPRI do not actually engage in combat on behalf of foreign powers, the skills they impart can prove just as deadly.[13] Nevertheless, the corporations involved in this business consider themselves military consultants engaged in the patriotic endeavor of furthering U.S. foreign policy rather than in a modern day

adaptation of classic mercenary activity. What pushes it into the mercenary category is that it contracts, on a proprietary basis, with a foreign power rather than providing services through the U.S. Government, which would include direct oversight by DOD managers and congressional visibility.

Current Policy

According to the National Security Strategy, the U.S. military helps shape the world's security environment by promoting regional stability in ways that protect and promote U.S. interests through forward stationing, defense cooperation, training and exercises with allies, and security assistance.[14] Many of the conditions that formerly guided the way we provided this military assistance have changed, however. Since the mid-1980s, congressional funding of military assistance programs has steadily declined, while FMS has increased.[15] More than ever before, foreign governments now shop around on the international market for the best deals in equipment and training.[16] As the U.S. defense budget has decreased, so has our ability to leverage government dollars and government personnel to provide military assistance to our allies.

The downsizing of the U.S. military, the drawdown of U.S. troops stationed abroad, and the reluctance of the United States to commit troops overseas have changed the way we look at security assistance and have increased the attractiveness of contracting out military services. Increasingly viewed as a cost-effective alternative, privatized assistance provides an expedient foreign policy tool for the President. It helps an administration stretch a shrinking budget while avoiding troop deployments where risks are high and national security interests may be low.[17] The crux of privatization is the transfer of a heretofore closely

held policy instrument from government to the private sector and permitting it to be accomplished for profit. Current policy, with its reshaping of accountability, a lack of public visibility on security assistance, and the impact of budget constraints and a smaller military force, fosters privatization.

Since 1995, the U.S. Government has allowed private corporations to train foreign armies outside the umbrella of official security assistance programs, which represents a fundamental change. Now privatized military assistance can be provided under the terms of a private contract negotiated between the military consultant firm and the foreign government, all with minimal oversight or control by the U.S. Government. For example, in 1995 the Republic of Croatia hired MPRI to train its army under a private contract between the firm and the government. After the signing of the Dayton Peace Accords, the Federation of Bosnia-Herzegovina also contracted with MPRI to train its armed forces as part of the "Equip and Train" program. The basis for this program was President Clinton's promise of training programs and provision of nonlethal assistance for the Bosnian Federation in his letter to then-Senate Majority Leader Robert Dole:[18]

> First of all, the United States will take a leadership role in coordinating an international effort to ensure the Bosnian Federation receives the assistance necessary to achieve an adequate military balance when IFOR leaves. Training programs and provision of nonlethal assistance can begin immediately after the peace agreement enters into force."[19]

In order to keep the American contingent of uniformed IFOR peacekeepers impartial and minimize U.S. military involvement, the U.S. Government encouraged private firms to offer their

services. B.M., SAID, and MARI all bid on this contract; MARI was selected by the Federation of Bosnia-Herzegovina. Mohamed Sacribey, at the time Bosnian foreign minister, said his government selected MARI because it was the next best thing to U.S. military assistance.[20] (It should be noted that up to this time in the Balkans, MARI has worked very closely with the U.S. Government and adheres to government-prescribed guidelines for contracting.)

In yet another non-U.S. Government security assistance program, MARI has secured a military assistance contract with Angola. It has received a license to provide training to the army and police forces of Angola. As of April 1998, this contract was in the last phase of negotiations.

Current policy also directs firms desiring to provide privatized military assistance to submit to a formal approval process by U.S. Government agencies. The Arms Export Control Act and the International Traffic in Arms Regulation detail the procedures implemented by the Department of State's Office of Defense Trade Controls (ODTC). After first registering with ODTC as a private company desiring to export, the firm must apply for a Technical Assistance Agreement (TAA), essentially a license, to provide a defense service. The private firm can then negotiate a contract with the foreign government for services to be rendered, the final version of which the firm must submit to ODTC for approval. ODTC staffs it through the State Department's country desk and finally to the Department of Defense. The final approval for this contract rests with the SES-level chief of ODTC. Under this process, the State Department must notify Congress of any contract exceeding $50 million. Despite these specific controls, private firms may first solicit business, then apply for a license from the State Department to conduct training

or other military expertise abroad. This administrative process takes place without any congressional oversight or even a report to Congress for all contracts under $50 million.

Congressional Oversight

Continuing a trend that began in the 1970s, Congress has increased its oversight of national security policy, including security assistance programs.[21] The Senate and House use legislation to delimit and guide implementation of military assistance programs.[22] They include or exclude specific nations and designate the level of funding for each.[23] The role of Congress is to act as a checks and balances system on the executive branch for foreign policy through lawmaking, funding, confirmation of personnel, oversight power, war power, or treaty power.[24] This ever-increasing congressional oversight, as perceived by the executive branch, has made it so cumbersome for the U.S. Government to provide security assistance as a tool of foreign policy that, as a result, the United States has opted in part for privatized alternatives. Thus, the unintended consequence of increased oversight has in fact moved a critical element of foreign policy to a private, pay-as-you-go affair. A post-Cold War world, increased regional instability, and a downsized U.S. military are factors that make the privatized alternative an attractive foreign policy tool.

The real problem is that privatized military assistance does not receive the same scrutiny as do government security assistance programs. Congressional review of FMS and IMET programs become part of public record. However, once the process starts down the private path, Congress receives notification only if the contract is greater than $50 million. As lethal or consequence-laden as they may be, most service contracts for training a foreign

army not involving the sale of military hardware cost less than this. In fact, MPRI contracts for training foreign armies, with the exception of the most recent renewal of the Bosnia contract, have all been for amounts of less than $50 million. Consequently, a private firm can train another nation's army without congressional notification, much less congressional approval. Thus, significant foreign policy actions related to foreign security assistance do not receive the benefit of the checks and balances system inherent in our system of government.

One can argue that avoiding congressional oversight is not all bad, and indeed privatized assistance offers some significant advantages. The United States can pursue its geopolitical interests without deploying forces into harm's way. When budget constraints and political sensitivities make it imprudent to overtly commit the power, prestige, and tax dollars of the United States directly, an administration can still implement foreign policy through private contracting. Thus removed from the purview of Congress because of the proprietary nature of the contract, international military assistance stays out of the political and public arenas. Additionally, congressional oversight and approvals take a great deal of time and often become mired in the politics of the moment. Privatization of this outsourcing effectively end-runs Congress and at the same time increases the President's ability to react and implement policy in a rapidly changing world.

Privatization, it can be argued, is also a much more cost-effective way for the United States to implement policy and influence actions. The deployment of U.S. Armed Forces to support security assistance programs represents a significant expense to U.S. taxpayers. Because contracting shifts the cost to the recipient, the United States can help an ally and improve

stability without committing forces or directly spending U.S. dollars. Furthermore, when a private company commits to a contract, it will not have another military commitment in another part of the world arise to pull it away. Private firms also have access to a large pool of highly qualified military members. For example, a private firm like MPRI can afford to send 20 former U.S. Army colonels to Bosnia, while the U.S. Army would have to strip more than an entire combat division to muster that many.

Yet, cost effectiveness is not always the best and certainly not the only criterion on which to base policy. The United States has the best military in the world; our soldiers' commitment to democratic values serves as an example to all. With the power and prestige that comes with being the world's only superpower, the United States should influence global security through closely controlled and government-monitored policies. Why should we allow private corporations to accomplish what is certainly more appropriately and legitimately in the government domain? The United States can reinforce its place in the world community and bolster its relationship with allies by committing forces. More importantly, unintended consequences of security assistance programs can be better managed if they remain under government control. In this uncertain world with its shifting alliances, the United States should stand strongly and visibly behind its commitments, or not undertake them in the first place. Moreover, we should not forget that the Constitution intended for the Congress to be a constitutionally independent, coequal, and democratically rooted voice in shaping U.S. foreign policy.[25] This includes routine oversight of Defense Department activities.[26] The use of privatized assistance circumvents time-tested congressional and public reviews integral to the system of

checks and balances that makes the U.S. Government unique. Privatized assistance represents a course of least resistance, which is not the best way to conduct foreign policy in the long run.

Foreign Policy by Default

As private military consultant corporations seek out business opportunities around the world, they are essentially making foreign policy without involvement of our elected officials or the public. The nature of the contract and the fact that it is between the private firm and the foreign government shield it from public view. The State Department does not have to disclose any information about contracted operations on the grounds it is considered proprietary information.[27] When the executive and legislative branches are marginalized from the dynamics of providing military assistance, foreign policy is made by default. In short, business interests motivated by profit are shaping foreign policy through the hiring out of military assistance. Hence, governmental transparency in foreign policy is lost to the privatization process when the public is not aware of major government-inspired operations because there is no U.S. troop deployment or monetary cost.[28]

The major example of foreign policy by default is privatized military assistance provided to Croatia. The State Department issued a license to MPRI and approved its contract in 1995. At this time, Croatia had been independent for only 3 years, during which it had been engaged nonstop in a civil war within the former Yugoslavia. With training and consultation from MPRI, the previously incompetent Croatian Army was transformed into a modern fighting force that surprised foes and observers alike with quick, choreographed movements of combined artillery, armor, and infantry to flank the Serb forces in August 1995, just

a few short months after MPRI began reshaping Croatian forces.[29] The entire operation bore the stamp of the minds that had orchestrated *Desert Storm*.[30]

This Croatian blitzkrieg, Operation *Storm*, resulted in a victory that displaced over 100,000 Serbs and drastically changed the map of the Balkans; it probably also brought the Serbs to the peace table. It is widely perceived that Croatia launched this attack with the tacit approval of the United States. Given the close ties of MPRI to the U.S. Government, one might well conclude that the U.S. unofficially encouraged this measure as a means to reach a peace. At best, the Croatian experience depicts foreign policy without involvement of U.S. troops or money. It produced favorable, if unintended, consequences. At worst, it is backroom foreign policy manipulated by the U.S. Government with the complicity of a private military consultant corporation.

Angola is another case of foreign policy by default. There, MPRI is planning to train the forces of Eduardo dos Santos despite his government's abysmal record on human rights. The administration would have a hard time selling Congress or the public on the policy of sending American troops to Angola to train its army. Unstable politically and with a recent history of both sides hiring mercenaries to fight a bloody civil war, Angola is clearly not a model candidate for U.S. security assistance, but it seems the Angolan Government will be receiving the equivalent in the form of privatized assistance. If this attempt to reform its military fails, the United States can distance itself from any official involvement. This is an illustration of how the lack of accountability allows foreign policy makers to support causes in a less than transparent manner. The aim appears to permit the administration to have the influence it wants without the political fallout and economic costs incurred from sending in U.S. Armed

Forces. This trend seems to justify what has become, in effect, the policy of giving increased military strength to those who can afford it.[31]

There is a fundamental difference between conducting foreign policy and running a private international business. In international business, investors seek to make a profit. Their attractiveness to potential clients is in the promise of economic growth and development for the foreign nation. With privatized military assistance, corporate military consultants sell improved military power as a product to their customers. This kind of product can rapidly change the balance of power within a country or region. Despite the rhetoric about training and integrating a disciplined military into society, most governments in developing countries see an improved military first as a way to control internal politics better and only second as a way to be more independent regionally. Improvement of an army means the potential for better management and application of violence to achieve political ends, first domestically and then internationally. Despite what the trainer may impart, from the recipient's point of view military expertise is quite divorced from democratization, human rights, and free economic practices.

This type of policy raises suspicions in the minds of allies. They will inevitably question the true commitment and intentions of a nation that speaks out of both sides of its mouth. In a multinational peace mission, it can disturb our partners and may even put U.S. troops at risk because of the appearance of partiality. Bosnia is a perfect example of this dichotomy. NATO Stabilization Force (SFOR) troops, including Americans, serving there since 1995 seek to keep the peace and appear impartial. Yet the private firm providing military assistance to the Federation of Bosnia-Herzegovina comprises Americans, including retired

generals. These private, contracted ex-soldiers hired to train send a mixed signal. On one hand, active duty U.S. uniformed soldiers serving in SFOR must maintain impartiality as peace enforcers among the former warring factions. On the other hand, the United States allows its private citizens to train one side to become more effective warfighters, from individual soldier skills to development of national integrated strategy.

Corruption of the Military

Private military consultants who train foreign armies outside the umbrella of official security assistance programs unwittingly undermine and corrupt the American military institution. Despite their apparent legitimacy based on their increased use as an informal foreign policy tool, in selling military expertise to other nations consultants taint basic American military ethics and blur the distinction between active duty soldiers and private consultants working for profit. The corporate appearance of these consultant firms, their connections with senior Defense Department officials, many of whom are life-long colleagues, and their locations in Washington, DC, seem to add respectability to the selling of warfighting skills. Nevertheless, these military consultants remain officers and soldiers, despite the fact that they have retired from active military service to their country, because they continue to participate and train others in the art of war.

Retired and former military who work for private corporations no longer owe formal allegiance to the United States in the same way as active duty soldiers. They are not bound by the codes, rules, and regulations that make the military services unique. As these private firms seek to improve militaries around the world, we are left trusting the moral conscience of a profit-motivated corporation for the actions of private citizens in

their capacity as trainers of a deadly profession. In essence, we have soldiers who have taken off the American uniform performing soldier tasks without the traditional rules, sanctions, or restraints imposed by a responsible government.

The U.S. military holds a special place in the hearts and minds of the American people, a bond as unique as America's civilization. This is jeopardized by the participation of former U.S. military officers and noncommissioned officers in international privatized military assistance. Both commissioned and noncommissioned officers are entrusted with the lives of their soldiers and employ them to fight and win the nation's wars. Among professionals in the United States, military officers consistently rank among the 10 highest on the scale of most respected. This stems from the integrity and values of the officer corps and the spirit of selfless service as embodied in the duty, honor, country creed. Moreover, the military professional's "behavior in relation to society is guided by an awareness that his skill can only be utilized for purposes approved by society through its political agent, the state."[32] Samuel Huntington, in his classic work concerning the soldier and his relationship to society, also noted, "The motivations of the officer are a technical love for his craft and the sense of social obligation to utilize this craft for the benefit of society."[33] These words describe the way society feels about and interacts with the military. When former officers sell their skills on the international market for profit, the entire profession loses its moral high ground with the American people.

The new paradigm of privatized international military assistance has far-reaching implications in the American democratic culture. It can profoundly change how we as a society interact with our military. The delicate balance among

the military, the government, and the people, the Clausewitzian trinity, is essential to our democratic culture.[34] This invaluable relationship has allowed us to successfully fight and win wars and provide a preeminent, effective foreign policy that coordinates ends, ways, and means in the overall grand strategy. However, this balance depends on the premise that our nation's military expertise is truly a servant of the nation and its people. As we blur the lines between corporate private military contracted by a foreign nation and our uniformed services, this premise becomes suspect and unbalances the trinity. The public could well begin to rely on the outsourcing of private military consultants to perform tasks traditionally done by active-duty uniformed military. Soon, the public and the government could feel that they could hire out military missions as if they were commercial enterprises. This would fundamentally redefine the military within society, and public trust would become part of history.

If the use of private military consultants becomes increasingly acceptable as a means to implement foreign policy, the public would associate the military with the profit motive—private firms are motivated by financial reward, while duty, loyalty, and allegiance to the country motivate the uniformed soldier.[35] The American public's faith in their military leaders would surely deteriorate when the public realizes that despite paying the military relatively well during active service and providing a generous pension, the retired military seek to cash in on their skills in foreign lands. It is hard to understand how one day the general in uniform is a selfless servant of the state motivated by love of country and dedicated to soldiers, and the day after retirement is selling his services to the highest foreign bidder. This contradicts the military ethic of selfless service and cheapens the profession of arms in the eyes of the public. The same is true

for all the other ranks as well. The public would eventually replace the trust it places in the hands of our military leaders to lead and care for the sons and daughters of America with the cynical belief that they are in it only for the money.

The military is very different from any other profession and is unique specifically because it comprises experts in warmaking and in the organized use of violence.[36] As professionals, military officers are bound by a code of ethics, serve a higher purpose, and fulfill a societal need. Their craft sets them apart from other professionals in that the application of military power is not comparable to a commercial service. Military professionals deal in life and death matters, and the application of their craft has potential implications for the rise and fall of governments. The means of managing violence must therefore never be released from service to the state, even for the most appealing of international situations. As Huntington so accurately summarizes, "Society has a direct, continuing, and general interest in the employment of this skill for the enhancement of its own military security. While all professions are to some extent regulated by the state, the military profession is monopolized by the state."[37]

Conclusions

The United States must be very careful to whom and under what conditions it sells the expertise to manage violence. Providing training without strings to organize and wage war is much like letting the genie out of the bottle. We cannot predict how, when, or why it will be used. The unintended consequences of widespread privatized military assistance around the globe could be disastrous. A better trained army may just be enough to trigger a regional war or power struggle, not to mention the

possibilities of internal repression. Despite well-intentioned instruction on primacy of civilian rule, rule of law, human rights, and democratization, building better armies around the world will not necessarily lead to stability or peace. The bottom line is, U.S. military expertise should not be for sale to the international market by private military consultant firms.

The United States should not employ private military consultants as a tool of foreign policy to train other nations' armies to fight wars. Private military assistance provided under contract between the firm and the foreign nation is not subject to congressional oversight or public scrutiny, because the contents of the contract are considered proprietary information. Thus, privatization is a way of going around Congress and not telling the public. Foreign policy is made by default to private military consultants motivated by bottom-line profits. Current policy allows and even encourages this new type of outsourcing, as shown in Croatia, in Bosnia, and soon in Angola. It has become an attractive, no-risk alternative in an era of shrinking resources.

Despite State Department licensing and approval procedures for privatized assistance, implementation is effectively removed from the purview of both Congress and the public. Despite the apparent benefits of cost effectiveness and lack of risk, private military assistance will always lack the power and legitimacy required of U.S foreign policy in the world community. While privatization may be touted as reform, it serves as a device to remove military expertise from the realm of public accountability.[38] It allows the President and his administration to conduct foreign policy without the costs or the commitment of U.S. troops and to distance themselves should the policy not work.

If left to free market forces, the privvatization of military services provided for profit to the international community corrupts our military by undermining faith in the institution and lessening public trust. It also creates a private organization of military expertise motivated by profit and neither employed by nor accountable to the government. Further, it upsets the delicate balance among the government, the people, and the military by blurring the lines between a military that works for the state and one that works for profit through the sale of military expertise. When military personnel, albeit retired, switch allegiance from the state to the private sector and the almighty dollar, they destroy the credibility of our uniformed forces.

Recommendations

The United States must change the current policy, which allows direct private military assistance to foreign armies, to one that puts control of contracts for military services with the Government. The U.S. Department of Defense should be the only agency allowed to provide or contract for this type of assistance. Huntington had it right: The provision of military services, especially the training of foreign armies, must remain a monopoly of the state. This will ensure the appropriate level of oversight and integration into foreign policy, as well as retain our military's integrity as an institution and accountability to the public.

If an administration cannot gain the backing of the American people to send uniformed forces, then the United States should not send its private citizens to do soldierly chores. Neither should a shrinking budget be an excuse to privatize military assistance either. Moreover, if we lack the military resources to conduct policy through our legislated security assistance

programs, we must suppress our appetite for military engagement around the globe or find alternative nonmilitary substitutes. Our nation must decide whether to increase our Armed Forces to carry on this type of foreign policy or just not do it. Our leaders must make these tough choices; otherwise we will continue to employ private military consultants to perform missions best left to our uniformed Armed Forces. We should not allow our leadership to elude direct responsibility by allowing the private sector to do what the public sector is unwilling or unable to do. Political expediency is not an excuse.

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Strategic Thinking in an Era of Intervention

JOHN RICHARDSON

We must not cease from exploration and the end of all our exploring will be to arrive where we began and to know the place for the first time.
T. S. Eliot

The art of strategy has challenged the most astute minds. History is both decorated with the spoils of strategic success and littered with the consequences of strategic miscalculation. Nation states and millions of lives hang in the balance in this game of highest stakes. Anybody who plays blackjack understands this. The rules are simple: One plays against the dealer; as each hand unfolds, players assess how that hand has shifted the "balance" of remaining face cards and aces—in blackjack, these cards are power. Over many hands, the odds are close to even for a skillful player capable of keeping track of the balance of "power" and adjusting the stakes at risk appropriately. At many levels the Cold War was like playing blackjack—but we've left the table.

Commander John Richardson, USN, shared third place in the 1998 Chairman of the Joint Chiefs of Staff Strategy Essay Competition with this entry, written while attending the National War College.

Throughout history, strategy, particularly military strategy, has been linked to technology. The partnership between technology and strategy has made it easier for one nation to intervene quicker and deeper into others' territories to threaten their military and civilian structure. This trend has progressed along both weapons range and mobility. Consequently, a nation's ability to prevent other actors from exerting influence—bringing force to bear—within its own borders has been consistently eroded. As weapon range has grown from the long-bow at Agincourt, to artillery and rifles, to barrels in the Civil War, to advanced artillery in World War I, weapon effectiveness has gradually increased, allowing an army greater stand-off distance. Similarly, as mobility has increased from the forced march in Napoleon's Wars, to the use of trains in the Mississippi Campaign in the Civil War and the Schlieffen Plan in World War I, to troop ships at Normandy and in the Pacific in World War II, the speed with which one could travel over distances and strike deep within an opponent's borders was increased. These two trends were, perhaps, first fully synthesized in the blitzkrieg of the German Panzer division in World War II and, most certainly, with the advent of urban bombing campaigns against Germany and Japan. In these two cases, mobility and weapon technology combined in unprecedented ways to permit striking the enemy well within his borders.

The next leap in intervention capability came with the launch of Sputnik in 1957, coupled with the maturation of nuclear weapons programs by several nations. Now, for the first time, an adversary could "reach" into another nation from intercontinental range and deliver devastating destruction. The implications were unmistakable: the new weapons were truly strategic, transcending

the tactical/operational dimensions to strike directly at the national strategic level.

However, designing, building, and fielding these weapons required access to relatively advanced scientific, manufacturing, and material resources, which limited the number of actors who could belong to this exclusive club. For those who chose to join, nuclear weapons left a "technological signature" that was easy to see and monitor. The signature was so clear that a strategy of nuclear deterrence could be developed in all its manifestations, from "nuclear parity" in the number and capability of deployed warheads, to the ability to respond to nuclear attack with a retaliatory strike in a matter of minutes.

The post-Cold War era may well turn out to be the Era of Intervention, for the capability to intervene has been taken to a new level. A growing array of tools allows small groups (both state and nonstate actors) to achieve devastating destruction within a nation's borders. These new weapons, permitting the few to threaten the many, require relatively low technology but are exceedingly difficult to detect, monitor, and control. Actual use of biological, chemical, or information weapons is quite difficult to trace to their source. This makes a strategy of deterrence a weak reed.

Concurrently, the United Nations is increasingly inclined to establish a military presence on the ground inside national borders. While these missions are for peacekeeping, peacemaking, starvation and genocide prevention, and a host of other humanitarian tasks—and are not necessarily "imposed" against a nation's will—they are, nevertheless, interventions. The net result is that now, more than at any time since the Treaty of Westphalia, borders are no impediment to intervention. Consequently, the strategic realm has drastically changed.

In a world no longer set in a two-piece mold, the United States is, with or without the complicity of the international community, the actor who sets the terms of interaction. This reality requires careful consideration of the ensuing strategic implications. Otherwise, the new hierarchy will bring more vulnerability than opportunity, with the U.S. advantage slowly decaying, thus opening the door to a world where anarchy reigns.

The Strategic Realm

The master strategist operates in a unique world comprising conflicting goals, perceptional prisms, and subtle maneuvers, where every action must be assessed for its strategic impact. Like a chess grandmaster, he must see the strategic implications of events and act to take fullest advantage of the situation.

Let's call this "world" of the strategist the *strategic realm*—an "idea space." "Geography" in this realm corresponds to a strategic understanding. To "occupy" terrain in the strategic realm means to have synthesized the strategic implications into one's decisionmaking process. The realm taken as a whole contains total strategic knowledge; to occupy the whole strategic realm means to have complete strategic understanding. Unfortunately, it is an immutable principle that no matter how hard one works at probing over the strategic horizon, no single strategist can occupy the whole realm at once. Everyone has "blind spots" generated by cultural biases, perceptive limits, and the often unforeseeable intent of the opponent. A region of the realm exclusively occupied by one actor includes all strategic implications *not* considered in the strategic process of other actors. Thus, one is always vulnerable to strategic surprise.

Historically, the strategic realm has been well differentiated. The basic characteristics of most historical strategies divide into

clear patterns: offensive or defensive, deterrent or coercing, conventional or nuclear, and other categories. A strategy may have been very aggressive and interventionist—such as U.S. strategy in Korea—or deterrent to prevent intervention—such as the U.S. strategy of containing the Soviet Union. One may have had an overall defensive posture, such as the early strategy of the Chinese during the war against Japan (both Red Army and Kuomintang Army together), or an offensive posture, such as the strategy of Hitler's Wehrmacht at the start of World War II. Historically, most strategies have been "Westphalian," in that they involved interactions in well-defined, "traditional" national roles.

That is changing. When warning and response are separated by mere minutes, seconds, or nanoseconds, how can an action be classified as defensive or offensive? When a nation establishes military presence in another's sovereign territory to keep the peace or prevent hostile action by an internal tribal leader, is this deterrence or coercion? Offense or defensive? Westphalian or post-Westphalian? Just as interstate borders have become less meaningful, traditional strategic boundaries have become more transparent. While the line separating strategic dimensions like defense and offense was always gray, the availability of weapons of intervention has blurred these distinctions beyond recognition, creating a chaotic strategic environment. As complicated as the historical description in the previous paragraph might seem, the strategic realm in the Era of Intervention is even more complex.

All points on the strategic realm are now interlinked. Activity in any one area of the strategic realm will reverberate in another remote region. Previously disconnected actors can now take advantage of the global character of conflict to "leap in" and seize the opportunity. These new "pile-on" actors may operate

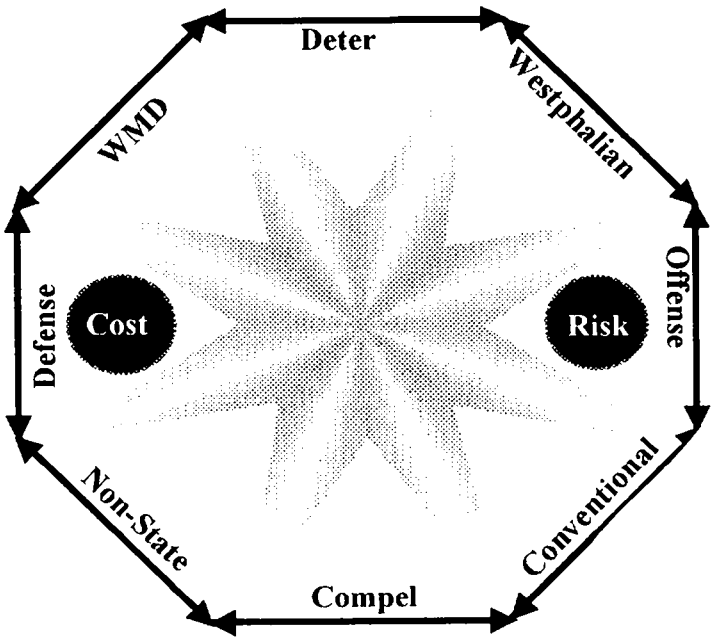
asymmetrically—synchronously or asynchronously—against the same actor, or a different actor. The strategic realm has become like a chaotic weather system, where a butterfly's flight in China may cause a tornado in the Midwest.

Figure 1 diagrams a conceptual strategic realm. Prominent in the realm are cost and risk, acting like magnetic poles, between which the strategic problem oscillates. The near-continuous transition from offense to defense, deterrence to coercion, conventional to WMD, and state to nonstate actors is also shown. This is not meant to depict an all-inclusive set of interactions but merely to illustrate the chaotic and interconnected character of the realm described above.

The strategist must try to survey this realm from as many angles as possible to appreciate the different perspectives that others might bring to the task. Aspects that are neglected (and there *will* be some, as discussed above) provide an opponent with the opportunity to set exclusive control over that strategic region. Therefore, as the strategist tries to see as much of the realm as possible, he is, simultaneously, trying to deny—or disrupt—such situational awareness to the opponent. Any region within the strategic realm that is exclusively occupied accords an advantage: a chance to conceal strategic options from the enemy and, should one choose to exploit that option, the opportunity to inflict strategic surprise. The goal of the master strategist, then, is to maximize the extent of the strategic terrain that is seen and grasped, while denying the same to one's opponents.

Given that the strategic realm contains all strategic possibilities, it would be helpful if there were a way to map the terrain and thereby ease navigation. Ideally, this would guide the strategist over as much of the realm as possible, providing the

Figure 1. The Strategic Realm



broadest understanding of all strategic alternatives before a final decision is made. Frameworks, or models, are useful in this context. The best include an identification of interests (ends), the resources to achieve or defend them (means), and the preferred method by which one goes about it (ways). They push the user out to the edges of the realm not by describing reality but by asking the right questions. With respect to the strategic realm, all strategically relevant frameworks fall into three basic categories: linear, regional (regions in the strategic realm, which do not directly coincide with geographic regions), and cyclic.

Linear frameworks (e.g., "top-down," or "bottom-up" approaches) have two major drawbacks. First, they do not allow for the inherent interdependence among the ends, ways, and means. Second, in this age of almost instantaneous feedback,

these models do not provide for the constant reassessment that is the essence of strategic decisions.

"Regional" models, including scenario-driven, threat-driven, mission-driven, and risk-minimizing approaches, identify a part of the strategic realm as the primary area of concern. This pre-designation limits the range of strategic options. Worse, a demarcated field in the strategic realm necessarily defines regions that are *not* considered, providing a bold "available" sign for an enemy to stake his claim. Like linear frameworks, regional approaches are also static; they fail to provide for self-evaluation.

The best strategic frameworks are dynamic, incorporating the nonlinear interdependence of ends, ways, and means and the necessity to reevaluate all aspects of the strategy: they are iterative (cyclic) and free of self-imposed constraints. When mapped in the strategic realm, cyclic frameworks encompass a dynamic area, a "strategic field," representing the spectrum of comprehension that has been incorporated into the strategic process. The strategist's goal is to expand the cycle until it captures the largest possible strategic field.

Driving the Cycle: Reality, Information, Perception

Information is the primary force that drives the strategic cycle. The information revolution has transformed the worlds of finance, security, and personal communications, seamlessly connecting people across borders. Yet, just as strategic failure has very rarely been due to a lack of information, more information does not automatically lead to better strategic performance. In a data-rich environment, it is more important than ever to systematically think through the impact of information on the strategic process.

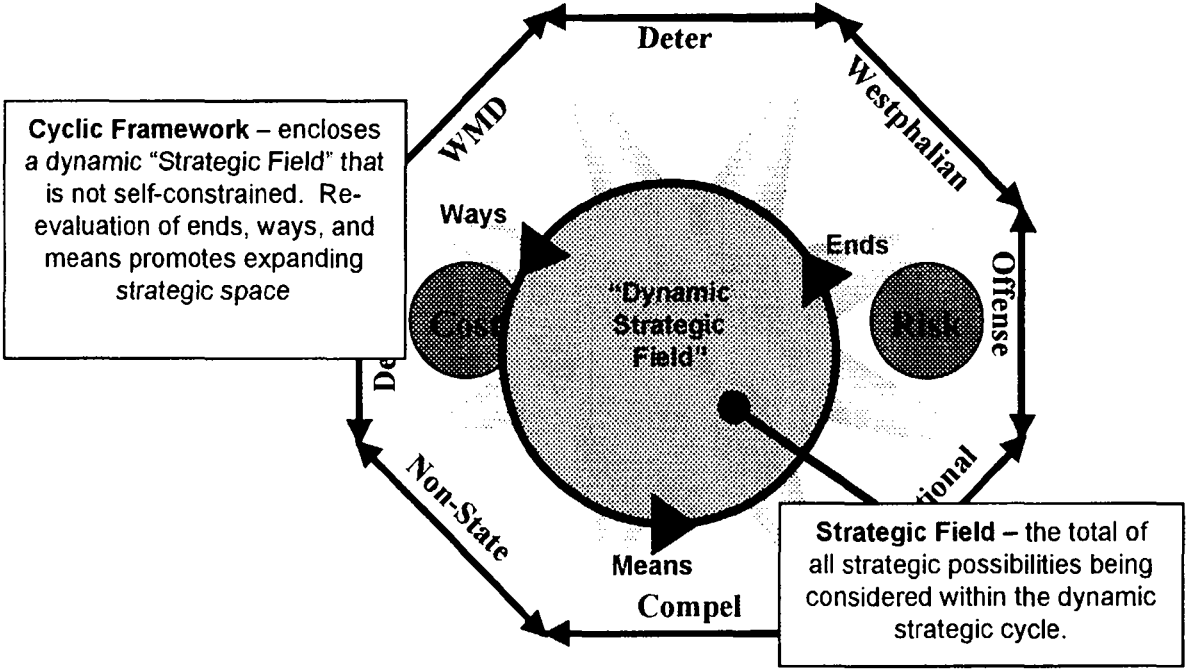


Figure 2. The Dynamic Strategic Cycle as a Tool to Explore the Strategic Realm

Like a master bridge player, the strategist must constantly discern, weigh, and balance the objectives of each fellow-player and try to estimate the cards each has to achieve those objectives. As a bridge player responds to successive bids—interpreting bids to estimate opponents' hands—a strategist responds to information, striving to grasp its strategic implications. The player that best understands not just information, but the *strategic transformation* of information, will triumph. Information drives the interaction of ends, ways, and means. Information about results (success or failure) is the force that fuels the necessary midcourse corrections.

There is a subtle but important difference between an *actual* event or fact, and *information about* that event or fact. Some facts make themselves very clearly and unmistakably known. As one proven strategist has put it, "Nothing gets your attention likes explosions on your runway."[1] In these cases, there is little difference between the information about the event and the actual event. But, in many cases, there is considerable difference between what actually happened and the report describing what happened. These differences arise for a variety of reasons: legitimate technical errors in communication, unintended perceptual distortion of a message as it passes from sender to receiver, and deliberate distortion of a message by an actor (allied or hostile) who stands to gain from such distortion. Creation of information that is completely false, having no connection with an actual event, is an extreme case of deliberate distortion. When differences arise between an actual event and the information about that event, it is the *information* about the event that drives the strategic cycle, not the actual event. If an informational report is always taken as truth, rather than somebody's (or something's) *representation of the truth,* this perceptual bias will

skew strategy. The strategist must keep this difference in mind when digesting information, for to neglect it is to create vulnerabilities.

The Medium is *Not* the Message

Different notations can be used to highlight the difference between raw information and its strategic content. Information (such as an intelligence report or a photograph) that is analyzed in terms of strategic implications—and thereby "transformed" onto the strategic realm—is referred to as a strategic vector (**SV**).[2] Like any vector, it has amplitude and direction. An **SV** not only connects data points in the strategic realm (e.g., ends to ways, ways to means), but also carries strategic "messages" between the two points. The strategic vector drives the strategic cycle (e.g. the *nature* of the interrelationship of ends to ways, ways to means). As it affects the strategic cycle, the **SV** that results from the transformation of raw information comprises three elements: strategic signal (**SS**), strategic noise (**SN**), and strategic antisignal (**SAS**). One could say that:

$$\mathbf{SV = SS + SN + SAS}$$

Strategic signal (**SS**) "expands" the strategic cycle, providing a broader understanding of the strategic problem. It "opens the strategist's eyes" to a wider range of alternatives. By according the strategist more options to ponder, **SS**, by its nature, *slows down the strategic cycle*, lengthening the decisionmaking process. To illustrate, an intelligence report that provides new insight into enemy intentions or capabilities, such as the first satellite image clearly showing a secretly acquired weapons system, should generate an effort to determine the *reasons* for acquisition, the

methods of employment, and most importantly, the implications for the *enemy's ability to wage war.* For example, Israeli intelligence knew well before the Yom Kippur War that Egypt and Syria had acquired advanced surface-to-air missiles and guided antitank weapons. Thus, the surprise was the unexpected, if not overwhelming, quantity and *effectiveness* of these weapons, rather than their mere employment. The first wave of Egyptian and Syrian troops fired *thousands* of missiles, exacting a tremendous toll on Israeli tanks and aircraft. As Defense Minister Moshe Dayan said, "It wasn't that they had the weapons, we knew that. What surprised us was that they used them in such numbers." The Arabs had changed their way of war, but Israel had not factored that possibility into its strategic cycle; it failed to occupy that portion of the strategic terrain. Consequently, Israel almost lost a war it couldn't afford to lose.

The second component of information is strategic noise (**SN**), information that, for better or worse, has no impact on the enclosed strategic field. It neither expands nor contracts the strategic cycle. **SN** comes in two forms: information that *has no strategic implications* for the problem at hand, merely cluttering the picture and wasting valuable time before being discarded; and information that *should have strategic implications*, but is disregarded before the implications are fully considered. The latter is really unrecognized **SS**, as the following example illustrates. In Vietnam, before the 1968 Tet offensive, the enemy's plans outlining the surprise attack were discovered and turned over to the American command. Although the plans were exact and detailed (**SS!**), they were treated as **SN** because they did not fit the American notion of the opponent's strategic aims. Instead of rejecting the possibility of attack because the plan appeared to be suicidal, U.S. planners should have expanded their

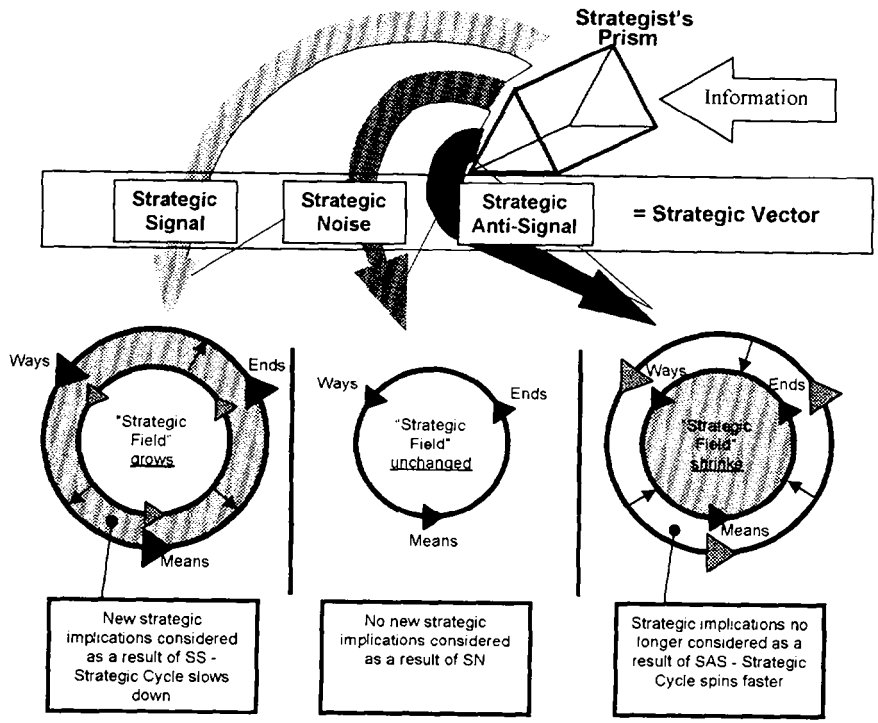
strategic cycle, trying to understand how such an attack could serve the enemy's rational objectives. Had this minimal level of credibility been given, the Americans could have at least attempted to exploit their tactical victory at Tet, before ceding strategic victory to the North Vietnamese. Instead, a chance to explore new strategic ground had passed unrecognized, contributing to our ultimate defeat.

The third element of information is strategic anti-signal (**SAS**). **SAS** tends to collapse the strategic cycle, making it both smaller and faster, as viable options are erroneously eliminated. False information, deliberately inserted as part of a deception plan, is an example of **SAS**. Perhaps the best example of effective **SAS** was the creation of "The Man Who Never Was,"[3] whereby Churchill and British Intelligence convinced Germany that the Allies were to invade Sardinia and Greece, instead of the actual target: Sicily. Based on this information, Hitler discarded the Sicily invasion as a strategic option, redirecting his defenses to cover false targets.

A more subtle but no less effective version of **SAS** occurred during the Yom Kippur War. The primary reason for the successful surprise was Israel's self-perception of invulnerability. On September 13, 1973, only 23 days before the surprise attack, Israel and Syria engaged in a major air-to-air battle, in which 13 Syrian jets were shot down. While the Israelis clearly won the tactical air battle, the strategic effect worked *against* them. The information was transformed into the strategic realm as **SAS**, reinforcing the mistaken notion that the Arabs would engage the Israeli Air Force in air-to-air combat, which Israel would decisively win. In fact, the enemy's plan hinged on asymmetry: surface-to-air missiles rather than air-to-air combat.

The analysis offered above indicates that the same data can be interpreted as **SS**, **SN**, or **SAS**. As illustrated by figure 3, the transformation of information into a strategic vector occurs via the perception of the strategist, the prism through which the information must pass before entering the strategic cycle.

Figure 3. Information Transformed by Strategist's Prism into a Strategic Vector



This transformation affects the grand strategist, the military strategist, the diplomat, and the economic advisor. Each has a distinct prism, a critical filter through which every bit of

information must pass. These strategists must work together to realize the National Security Strategy. Through their interactions, the dynamic strategic cycle expands to its full potential, bringing in all the elements of national power into a single, integrated framework.

Developing the Strategic Cycle

Grand strategy must consider all elements of national power: diplomatic, economic, and military. While each subordinate has its own strategic cycle—with tailored ends, ways, and means—all support the grand strategic cycle. To achieve a coherent national security strategy, the grand strategist must align and synchronize the strategic cycles for each of the elements of power.

Grand strategy is no longer the sum of its parts. It is now a nonlinear synthesis of the subordinate strategic cycles with the grand strategy. The once relatively discrete fields of diplomacy, economics, and defense have been seamlessly fused. The President, Ambassador, military Commander in Chief (CINC), and the economic advisor must operate synergistically. The increasing tendency to intervene, coupled with the global flow of information, creates a situation whereby the grand strategist can be called upon to account for, in near-real time, the consequences of any step taken by any other U.S. actor, no matter how trivial or remote. All strategists are now chaotically interlinked. A shot heard in Bosnia echoes in the White House. The result is a new dimension for strategic engagement—the strategic framework is no longer a cycle, but a vortex.

Figure 4 depicts two directions for the flow of strategic vectors (**SVs**): internal (connecting cycle-to-cycle) and external (driving the cycles around). Internal strategic vectors connect the grand strategist to his subordinate strategists; they also link each

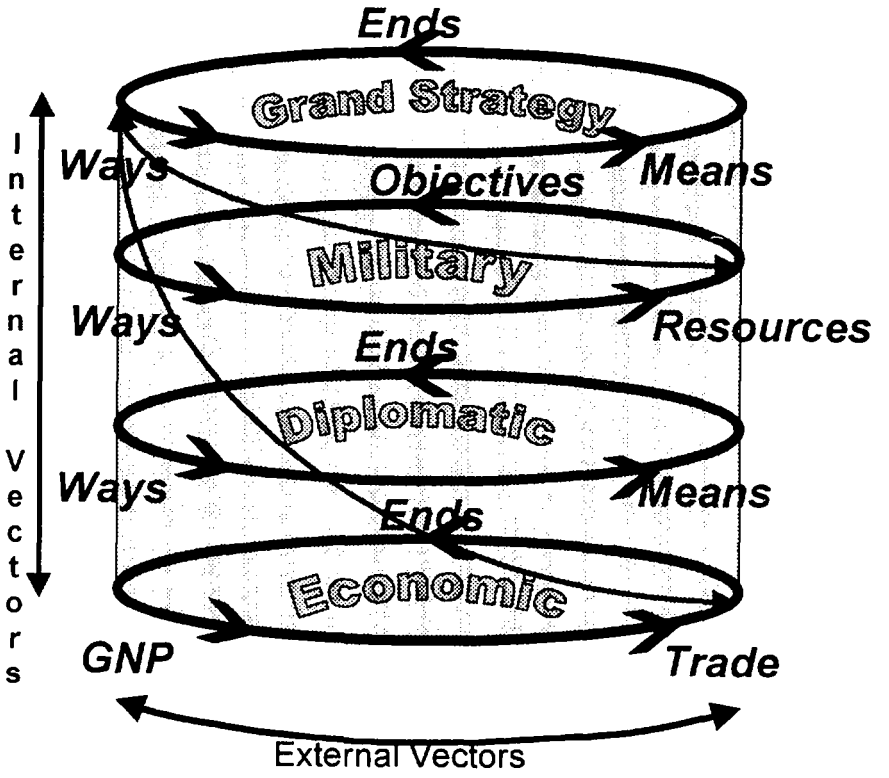
strategic dimension with the others. External strategic vectors drive the speed of the strategic cycles, thus demarcating the strategic field. As Sun Tzu suggests, the two directions are mutually reproductive. The existence of external vectors (generated by the transformation of external information) necessitates a proportional network of internal vectors to communicate the strategic implications throughout the strategic vortex. Should the internal vectors prove inadequate, the strategic cycle could be desynchronized, overdriven by external events. Establishing and maintaining this proportionality have critical ramifications for the strategic practitioner.

Within the three-dimensional strategic vortex, the goal of all strategists is now twofold: Within any component strategic cycle, the first goal is to maximize the size of the strategic field; the second goal is to maintain all component strategic cycles aligned and synchronized. Inadequate internal strategic information flow risks strategic incoherence.

Caught in the Vortex

The grand strategist must communicate with each of his subordinates frequently enough and fast enough to ensure that they stay aligned. The Internal Vectors must be proportional to the External Vectors that are driving the component strategic cycles. The faster and more forcefully events are moving, the stronger internal connections within the vortex must be. In today's crises, *near seamless communications* must exist to achieve a stable network. Each strategist must ensure that connections *within* the vortex respond at least as fast as events *drive* the vortex. If one strategic cycle should, through inadequate connectivity, become isolated or desynchronized, the vortex becomes twisted, and the grand strategic framework falls apart.

Figure 4. The Dynamic Strategic Vortex



The relationship between Golda Meir and Moshe Dayan before the Yom Kippur War is a case in point. Meir was the first Israeli Prime Minister without military experience. Dayan was larger than life, the hero of the 1948, 1956, and 1967 wars. Consequently, Meir delegated all security matters to Dayan's purview. For his part, by 1973 Moshe Dayan was no longer the bold master strategist, he was less aggressive, more bureaucratic. Effectively, nobody was "minding the store," yet each assumed the other was. The grand strategist became disconnected from her military strategist, who in turn was disconnected from the

General Staff. Worse, Dayan filtered out strategic signals from the military, making the strategic surprise all but inevitable.[4] A less subtle example occurred during the Korean War, when General MacArthur deliberately disconnected himself from the grand strategist to pursue his own notion of victory.

A short conversation between a theater CINC and the Secretary of Defense may contain more strategically relevant information than a CD-ROM full of imagery. Strategic vectors are about ideas and perceptions—raw intelligence, media reports, and other forms of electronic data transmit information rather than strategic implications. This is an important distinction, especially for the military operations other than war that the United States is undertaking. In these scenarios, we have clear information superiority in the field. However, we fail to recognize the associated limitations and vulnerabilities. While our opponents are unable to challenge our information dominance, they have developed a highly sophisticated understanding of the difference between information and strategic message. They have become masters at inserting **SAS** into our cycle, primarily through the media. For instance, during the Bosnian war, CNN broadcasts described the horrors of shelling in downtown Sarajevo but showed footage of shells falling on a different city—the video of the actual event was deemed insufficiently horrible to match the script.[5] The lesson was not lost on the Kosovo Liberation Army (KLA), whose information operations portray Kosovars as victims of Serb-sponsored "genocide" and "ethnic cleansing," buzz words that had proven so effective throughout what was Yugoslavia.

Much has been made of the so-called "CNN effect" on the outcome of strategy and national policy. Whether or not the media actually drive policy, they certainly *accelerate the*

process—requiring leaders to comment on strategies, expected outcomes and, if the reporter presses the point, proposed modifications.

The impact of this acceleration becomes clear in two ways. First, the *net effect of speeding up the decision cycle is to shrink the strategic field.* Consequently, strategic choices derive from a curtailed range of strategic options. Next, the instantaneous information link that the media provide stresses the network of internal vectors required to keep the strategic vortex synchronized. When a crisis occurs, *strategic* linkage is often neglected; instead, reactive policies are formed, before the strategic context is fully understood but just in time for the press filing deadline. The extraordinarily agile strategic antisignal jams the internal strategic signal. Far from achieving dominance, we become outmaneuvered in the strategic realm.

Tornado Watch!

The strategic pressures so far described originate primarily as a result of the opponent's superior strategic instincts. A more extreme external pressure could arise from the widespread availability of multiple asymmetric "means." Some eventualities—or actual events—are so overwhelming that they transform directly to the strategic realm. The development of nuclear missiles was such an event. This capability provided the means to strike at a nation's heart with unimaginable horror. The strategic implications of these weapons were obvious to the whole world, regardless of what their perceptual prism looked like. As a consequence, in the 53 years since their first employment, nuclear weapons have yet to be used again by anyone, in spite of a wide range of countries and cultures possessing them.

Now, in addition to nuclear weapons, chemical, biological, and informational weapons allow a small group of actors, state or nonstate, to intervene deep into the borders, indeed the psyche, of another nation with devastating strategic implications. In the Era of Intervention, new weapons of mass destruction (or disruption), thicken the "fog of war" not only on the battlefield, but more significantly in the *strategic* realm. Clausewitzian fog will envelop the strategic realm.

Clausewitz states that the "supreme, most far-reaching act of judgment that the statesman and the commander have to make is to establish . . . the kind of war on which they are embarking, neither mistaking it for, nor trying to turn it into, something alien to its nature."[6] Now a single event, the use of a biological weapon against a deployed United States peacekeeping force, for instance, introduces so much external pressure (strategic antisignal) that the strategic vortex collapses, becoming a tornado. Like its meteorological counterpart, this tornado rips the strategic realm apart, and the strategist's prism is shattered. The employment of highly destructive and deeply intervening weapons seems to make the "supreme act of judgment" impossible. Is theory, then, doomed to irrelevance in the face of the strategic tornado?

Clausewitz provides the answer to the challenge. The "force" that slows down the strategic cycle and helps retain a coherent strategic picture is the *will* of the strategist, supported by theory and, to the fullest extent possible, sharpened by experience. The language evokes images of Clausewitz himself squinting towards the horizons of the strategic realm:

> On the one hand, military operations appear extremely simple. . . . At the same time we see how many factors are involved and have to be weighed against one another; the vast almost infinite

> distance there can be between a cause and its effect, and the countless ways in which these elements can be combined. The function of theory is to put this all in systematic order, clearly and comprehensively, and to trace each action to an adequate, compelling cause. . . . When all is said and done, it is really the commander's *coup d'oeil*, his ability to see things simply, to identify the whole business of war completely with himself, that is the essence of good generalship. Only if the mind works in this comprehensive fashion can it achieve the freedom it needs to dominate events and not be dominated by them.[7]

This *strategic coup d'oeil* alone allows the exercise of will unconstrained by doubt. Theory must be mastered and then honed through practice, so that as the tornado rages, the strategist has the presence of mind required to exercise his will, despite the chaos inherent in the strategic realm. The strategist must explore the strategic terrain using theory, history, experience, and realistic scenario-driven exercises, so that he can anticipate the stumbling blocks when the fog closes in. If he neglects these duties, the tornado will sweep him away. He will not be in Kansas anymore.

The Soldier *is* the Statesman

American sailors are often reminded as they go ashore for liberty to remember that they are ambassadors for the United States; indeed, all military personnel deployed overseas are told the same thing. In an era where the borders between soldiering and statecraft have been blurred, this is truer than ever. Now, a liberty incident can have immediate ramifications on America's position in a foreign country, ramifications that may require the theater CINC, Secretary of Defense, or even the President to respond. It is thus more important than ever for the military

commander to understand the vulnerabilities that have arisen in the Era of Intervention, for he is most vulnerable to becoming strategically misaligned or caught up in a strategic tornado.

Deployed in the field, far from the decision cycle in Washington, DC, the commander is always challenged to stay in the loop. This challenge becomes more formidable as events move faster in his theater, where the indigenous infrastructure cannot begin to support the requirements to stay strategically connected. In these cases, increasingly typical of the missions assigned to U.S. forces, the commander must expend significant energy to establish and maintain the internal strategic vectors required to keep synchronized. As the commander becomes more remotely deployed, and "interest level" for his mission fades among policy makers, there is a growing vulnerability that he will end up "on his own" at the end of a very long and tenuous strategic vector.

Further, the commander is also vulnerable to misalignment because he does not operate exclusively on the same time scale as the rest of the vortex. While most of the vortex operates in the arena of meetings, phone calls, and teleconferences, the commander still must keep one foot in the arena of troops and tanks over ground, ships over sea, and aircraft through the air. It is the commander's responsibility to ensure that his forces, operating in the "miles per hour" dimension, stay synchronized with the strategic efforts happening in the "56K baud" ether. When the military gets disconnected from the message, the military commander becomes misaligned within the strategic vortex. Only the most accomplished strategic conductor can bring this disjointed orchestra together and make music.

Misalignment could also arise from the very nature of military strategy. Because it has less momentum, political strategy is

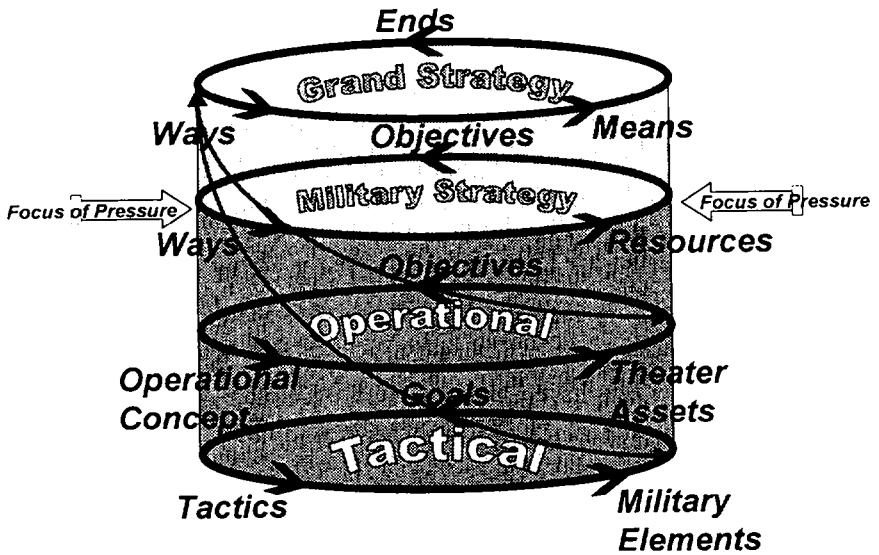
generally more agile than military strategy. The military is historically slow to respond to major political shifts. The armies that confronted Napoleon were slow to react to his new concept of national war and were consequently soundly defeated until they adapted to the ferocity of this type of combat. In the Korean and Vietnam Wars, U.S. national strategy looked for "limited" solutions. The military, forged in the fire of total war and decisive victory in World War II, struggled to conform to the new political strategy. As nuclear strategy matured, it was civilian, not military leaders who developed the new concepts that would govern nuclear deterrence.

The sort of events that exert extreme pressure on the strategic vortex, whipping it into a tornado, are those that are so tactically and operationally powerful that they transform directly into the strategic realm—because they are so devastating in the operational arena, they can potentially shatter the strategist's prism. These events have a higher probability of occurring in the area of responsibility of the military commander—his troops are a choice target for actors wishing to strike out at the United States.

Should one of these events occur, strategists will be struggling to maintain their equilibrium within the vortex. More acutely, the military commander, especially at the CINC level, must also strive to see through and transcend the tactical, operational, and strategic fog and friction caused by the event that occurred in his area of responsibility. Strategic collapse, and the resulting tornado, will most likely occur at this point of greatest pressure, at the theater commander level. Figure 5 depicts the commander's vortex, showing the two domains that the commander must keep synchronized: one purely conceptual

and the other physical. The arrows show the theater CINC at the focal point of strategic and desynchronizing pressure.

Figure 5. The Military Commander's Vortex



Military commanders are more susceptible to strategic anti-signal. This arises from two sources: internal and external to the command. Internally, the commander works hard to develop a climate that sets the rules governing the conduct of all subordinates. To the degree that the team adopts the commander's approach, they will be supporting the command. Unfortunately, they will also be "seeing" through the same strategic prism as the commander, which, as a stand-alone filter, creates command vulnerabilities that can be exploited. To say it another way, in addition to all the inherent difficulties of trying to transcend one's own perceptual prism, the military commander must also fight the "pride of ownership"—for he built that prism

and made it his command policy. To get around this vulnerability, the commander must strive to foster a team that "sees around" his prism, while maintaining command discipline. A different perspective is difficult to recognize in real time. It most often appears as a "troublemaker" who does not seem to "get it." Those officers who challenge the command climate tax the patience and energy of the commander who is already under tremendous burden, particularly in times of strategic pressure, *when the new perspective is most needed.* Nevertheless, freedom to challenge strategic assumptions is a necessary step to seeing more of the strategic realm. It trains and strengthens everyone's *strategic coup d'oeil.*

Concurrently, any deployed unit is highly vulnerable to enemy-induced strategic antisignals from the media, local information operations, cultural differences, and mixed messages from the local population, be they allied or hostile. The unit in the field is a sponge for misinformation, which transforms into **SAS**, thus adding a rarely recognized vulnerability.

A Box With No Sides

Clay is molded to form a vessel,
But it is on its non-being that the usefulness of the utensil depends.
Door and windows are cut to make a room,
But it is on its non-being that the utility of the room depends.

Lao Tzu

The "Era of Intervention" is a catch phrase. It is proposed to describe the nature of geostrategy as the world emerges from the icy waters of the Cold War. This nature will be characterized by the dissolution of traditional boundaries. We are already seeing national borders become more and more porous to migration, information, capital, and even military presence. While the

nation-state is still the primary actor today, nonstate actors, legitimate and otherwise, are gaining political ground. These actors have at their disposal unconventional methods that can rip the civic fabric of a nation apart.

The loss of homeland sanctuary has been translated to the strategic realm. Traditional approaches to strategy are less relevant when applied to problems that arise from "free-floating actors," unconstrained by traditional, Westphalian military or diplomatic protocols. Like the world of nations, the strategic realm has become chaotic. Consequently, the strategic process itself has become a seamless fusion of all elements of national power. Old distinctions among diplomatic, military, and economic power are gone; all strategy has been subsumed into the strategic vortex. If the strategist fails to recognize and account for this new dimension, the vortex will become disconnected, and the component strategic cycles misaligned. The result is poorly executed, confused policy that may shatter strategic focus altogether in the face of a massive intervention.

Far from giving in to the anarchy, the strategist must strive ever harder to see structure in the chaos. No longer limited to the battlefield, *coup d'oeil* must be cultivated at all strategic levels. More than ever, the strategist will have the opportunity to demonstrate genius, the chance, nay *necessity*, to exert his will unconstrained by doubt. In an era defined by dissolving boundaries, any emerging structure will hinge on the perception of the strategist. Recognizing this fact is critical to overcoming this vulnerability. The alternative is to be strategically outflanked in the strategic realm.

Students of strategy are often encouraged to "think out of the box," to find creative solutions to problems. But one cannot "think out of the box" if the box has no boundaries, no sides.

Therefore, one must first impose his will and construct a box. A structure must be developed in order to form a strategy. But like the clay vessel, it is on its nonbeing that the usefulness of a framework ultimately depends.

Notes

1. "Surprise, Deception, Warning and War," lecture by Dr. Ilana Kass, National War College, March 17, 1998.

2. This process of transforming information has a mathematical equivalent in the Fourier Transform, which allows a person to look and analyze a time-varying signal (like a radio wave) in terms of its spectral, or frequency, composition. By transforming the time-varying signal into "frequency-space," it allows the analyst to use a wide variety of techniques not available in the temporal domain. For this discussion, we will think in terms of "transforming" raw informational reports into their strategic components which operate on the strategic realm.

3. Ewen Montagu, *The Man Who Never Was* (Philadelphia, PA : Lippincott, 1954). This true story gives a fascinating account of the creation of a strategic antisignal. Throughout this book, the primary goal fixed in the minds of the British deception team was how the details of their plan would effect the strategic cycle of their enemy, the German General Staff. All their efforts were aimed at shrinking the strategic space within this cycle.

4. A peripheral but contributing factor was Meir's physical absence from Israel in the days just before the attack. She had gone to Austria to negotiate a settlement regarding an attack on Jewish refugees from the Soviet Union and the subsequent closure of a refugee camp in Schonau. The physical separation only served to enhance the strategic disconnect that already existed as the crisis approached.

5. Visitor from the IREX Institute, conversation with author at study seminar, National War College, March 23, 1998.

6. Carl von Clausewitz, *On War,* ed. and trans. Michael Howard and Peter Paret (Princeton, NJ: Princeton University Press, 1984), 88.

7. Ibid., 578.

The 17th Annual Chairman of the Joint Chiefs of Staff Strategy Essay Competition

The National Defense University (NDU) has conducted the Chairman of the Joint Chiefs of Staff Strategy Essay Competition since 1982. Through this competition students at professional military education institutions are challenged to write original essays about significant aspects of national security strategy. The competition rewards the best contributions with prizes presented through the generosity of the NDU Foundation together with the opportunity for subsequent publication by NDU Press.

Essays by students enrolled in either senior or intermediate service colleges as well as in the constituent colleges of NDU (the Industrial College of the Armed Forces, National War College, and Armed Forces Staff College) are eligible. Essays must be the author's own work and be completed during the academic year. Intermediate college entries are submitted through the respective senior college and count as part of that college's quota.

Competitors may write on any dimension of national security strategy—the political, economic, industrial, psychological, and military instruments of national power as used in war and peace to achieve strategic objectives. Essays with a joint emphasis, including historical contributions, are encouraged.

Senior colleges—working in conjunction with intermediate-level colleges—select no more than eight essays (including the

intermediate college entries) for final competition. On May 21 and 22, 1998, NDU convened a panel of judges in Washington, DC, to evaluate the entries. The 1998 judges were:

Colonel J. Lee Blank, USAF, National War College
Colonel Robert Bonn, USAF, Air War College
Charles C. Chadbourne III, Naval War College
B.F. Cooling, Industrial College of the Armed Forces
Dan Fitz-Simons, Marine Corps Command and Staff College
Joseph E. Goldberg, Industrial College of the Armed Forces
Captain Chester E. Helms, USN, Naval War College
Colonel John J. Madigan III, USA (Ret.),
U.S. Army War College
James Mowbray, Air War College
Patricia S. Pond, U.S. Army War College
Joe Strange, Marine Corps War College
John Treacy, National War College

On June 5, 1998, General Henry H. Shelton, USA, Chairman of the Joint Chiefs of Staff, presented the awards to the five winners of the competition whose essays appear in this volume.

The 1998 competition was administered by Robert A. Silano, Director of Publications in the Institute for National Strategic Studies at NDU, with the assistance of George Maerz, Mary Sommerville, Jonathan Pierce, and Myrna Myers of NDU Press.

Presenting the winners of the 17th annual essay competition:

S.M. Fenstermacher
"Does the 1997 Quadrennial Defense Review (QDR) Adequately Address Third Wave Logistics?"

Jay Lee Hatton
"We Deceive Ourselves: The Role of Preconception in Operational Deception"

Edward J. Felker
"Airpower, Chaos, and Infrastructure: Lords of the Rings"

Bruce D. Grant
"U.S. Military Expertise for Sale: Private Military Consultants as a Tool of Foreign Policy"

John Richardson
"Strategic Thinking in an Era of Intervention"

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